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Scientific Activities of

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Scientific Activities of

the Government of Alberta

Survey Results, 1989 – 90

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FOREWORD

This report presents a summary of results from the sixteenth annual survey of scientific activities of the Government of Alberta. The survey was conducted in June, 1990, by Bert Plaus of Statistics Canada with the co-operation and assistance of Jan Speirs of Alberta Technology, Research and Telecommunications.

Currently this survey is conducted for all provinces except Prince Edward Island and the Yukon and Northwest Territories. Similar reports for other provinces, are available on request from the provincial Ministry sponsoring the survey. A list of the provincial co-ordinators is provided at the end of this report. Statistics Canada will also make available a summary report including an historical account of all scientific data available at the provincial government level.

Science surveys, like many other surveys, are based on the respondents' interpretation of definitions and methods of calculation. The accounting records available rarely use a science-based classification. Although the data are estimates, they are still a good representation of the current science expenditures and manpower for the province of Alberta.

Surveys of the scientific activities of provincial governments serve several purposes. They provide an essential data base for analysis and the formulation of provincial science policy. They also provide data for the development of a national aggregate R&D series. National aggregates are published by Statistics Canada in **Indicators of Science and Technology**, (Catalogue No. 88-002 Vol. 2 No. 2). The national aggregates are also needed to complete the international questionnaires for the Organization for Economic Co-operation and Development (OECD) and the United Nations Education, Science and Culture Organization (UNESCO).

This is the third year that person-years and associated costs devoted to the administration of extramural programs (AEP) are being shown separately. These data have in previous years been included with the intramural activities of the individual departments.

Any questions pertaining to the data should be directed to Jan Speirs of Alberta Technology, Research and Telecommunications. The success of the survey is largely due to the goodwill and efforts of officials of the responding Departments and agencies. Their efforts in completing the questionnaire are gratefully acknowledged and appreciated.

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Statistical Tables

	All Sciences		Natural Sciences		Social Sciences and Humanities	
	Table	Page	Table	Page	Table	Page
Historical Series:						
Total Expenditures:						
by Activity	1	14	23	39	45	55
by Department	2	15	24	39	46	56
by Performer	3	16	25	40	47	57
Total Expenditures on R&D:						
by Performer	4	16	26	40	48	57
by Department	5	17	27	41	49	58
Departmental Personnel Engaged in Science Activities	6	18	28	41	50	59
Expenditures in 1989-90 Fiscal Year:						
Total Expenditures:						
by Sources of Funds	7	19	29	42	51	59
by Activity and Performer	8	20	30	42	52	60
by Department and Performer	9	21	31	43	53	60
by Department and Activity	10	22	32	43	54	61
Total Expenditures on R&D by Department and Performer	11	22	33	44	55	61
Intramural Expenditures by Department and Type of Expenditure	12	23	34	44	56	62
Departmental Personnel Engaged in Science Activities	13	24	35	45	57	63
Objectives of Expenditures:						
by Department	14	26	36	46	58	64
by Activity	15	29	37	47	59	65

Statistical Tables

	All Sciences		Natural Sciences		Social Sciences and Humanities	
	Table	Page	Table	Page	Table	Page
Estimates for 1990-91 Fiscal Year:						
Total Expenditures:						
by Activity and Performer	16	30	38	48	60	66
by Department and Performer	17	30	39	48	61	66
by Department and Activity	18	31	40	49	62	67
Total Expenditures on R&D by Department and Performer	19	31	41	49	63	67
Departmental Personnel Engaged in Science Activities	20	32	42	50	64	68
Objectives of Expenditures:						
by Department	21	34	43	51	65	69
by Activity	22	37	44	53	66	70

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The following symbols are used in this report:

-	nil or zero
—	too small to be expressed
...	figures not available or not applicable
r	revised figures
e	estimated figures

DEFINITIONS

This report covers those scientific and technological activities which involve the generation, dissemination and application of new scientific and technological knowledge. The central activity is **research and experimental development** (R&D). In addition, there are a number of activities closely related to R&D and are referred to as the **related scientific activities** (RSA).

R&D is creative work undertaken on a systematic basis in order to increase the stock of scientific and technical knowledge, as well as knowledge of humans, their culture and society; and the use of this knowledge to devise new applications. The central characteristic of R&D is an appreciable element of novelty and uncertainty. It requires the acquisition of knowledge and not just information. New knowledge involves the integration of newly acquired information into existing hypotheses, the formulation and testing of new hypotheses or the re-evaluation of existing observations.

The major **related scientific activities** are education support, technical surveys, statistical surveys, information services, special services and studies, and museum services. Education support and museum services are largely self-explanatory.

Technical surveys are activities directed towards the exploration and systematic description of the earth and its natural resources. The activities include the gathering, processing, collating and analyzing of data on natural phenomena except when part of a research project or a museum service. The preparation of maps and survey reports, their printing and cataloguing, are also included.

Statistical surveys are activities directed towards the collecting, processing and disseminating of statistics on humankind, their economic and social activities. Included are the development of technical methodology, statistical analysis and vital statistics.

Information services are activities directed to recording, classifying, translating, and disseminating scientific and technological information (**Technology Transfer**) as well as information resulting from R&D in the social sciences or required in support of such R&D. Included are the operations of scientific and technical libraries, specialized libraries and archives, the publication of scientific journals and bibliographies, and the organizing of scientific conferences. Grants for the publication of scholarly works are also included.

Special services and studies in the natural sciences are activities directed towards the establishment of national and provincial standards for materials, devices, products and processes; the calibration of secondary standards; non-routine quality testing; feasibility studies and demonstration projects. In the social sciences, special services and studies are systematic investigations carried out in order to provide information needed for planning or policy formulation, including feasibility studies, and demonstration projects.

There are also two different science types that are identified by this survey; the natural sciences and the social sciences and humanities.

Natural sciences consist of disciplines concerned with understanding, exploring, developing or utilizing the natural world. Included are the engineering, mathematical, environmental, life and physical sciences.

Social sciences and humanities include all disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans. Included are such disciplines as anthropology, business administration and commerce, communications, criminology, demography, economics, geography, history, languages, literature and linguistics, law, library science, philosophy, political science, psychology, religious studies, social work, sociology and urban and regional studies.

Five **performing sectors** are identified besides the Alberta Research Council. **Intramural** refers to units of the provincial government performing scientific activities that are normally carried out by personnel assigned to the Department and usually in facilities of the Department. **Industry** consists largely of private corporations but also includes crown corporations with a commercial function (e.g., power utilities) and industrial research institutes not controlled by another institution. Consultants providing scientific and engineering services are also included. **Universities** cover post-secondary educational institutions and affiliated teaching and research facilities. Also included are industrial research institutes affiliated with a university. **Hospitals and health organizations** are health organizations such as the Heart Foundation and hospitals which do not belong to the universities sector. **Other** includes non-resident performers of scientific activities funded by the provincial government, as well as recipients not covered elsewhere such as federal government, other provincial Departments, individuals, and foreign.

Expenditures are either current or capital. **Current expenditures** include costs of personnel, transportation and communications, information, professional and special services, rentals, purchased repair and upkeep, utilities, materials and supplies. **Capital expenditures** are those for the construction and acquisition of land, buildings, machinery and equipment. **Total expenditures** comprise current plus capital expenditures.

Departmental personnel data are requested by activity and category of employment in person-years or full-time equivalent. A person totally working full-time on a scientific activity is counted one person-year . Those working only part-time on scientific activities are considered as a fraction of a person-year, according to their involvement. Both permanent and non-permanent employees are included.

Objectives of expenditures are requested by activity and performer (intramural or extramural). The objectives listed are intended to cover the major areas of current economic, political and technological interest. Data are to be reported under the objective which is primary to that expenditure. Generally, the objective selected should be consistent with the stated objectives of the reporting department.

HIGHLIGHTS

In the 1989-90 fiscal year the Government of Alberta spent $247.3 million or 2.3% of its budgeted expenditures on scientific activities. In 1990-91, $270.8 million or 2.7% of budgetary expenditures are estimated for scientific activities.

TEXT TABLE I. Government of Alberta Scientific Indicators

Year	GDP implicit price index[1] (1981=100)	Government Expenditures on scientific activities		Estimated government expenditures[2]	Scientific activities as a percent of estimated expenditures
		Current dollars	1981 dollars		
		in millions of dollars		in millions of dollars	percent
1982-83	108.7	212.8	195.8	9,109.9	2.3
1983-84	114.1	238.9	209.4	9,199.6	2.6
1984-85	117.7	276.7	235.1	9,057.6	3.1
1985-86	120.7	272.4	225.7	10,306.5	2.7
1986-87	123.6	333.4	269.7	10,579.2	3.2
1987-88	129.0	254.2	197.1	9,909.3	2.6
1988-89	134.3	248.7	185.2	10,253.0	2.4
1989-90	140.8	247.3	175.6	10,700.2	2.3
1990-91	...	270.8	...	11,010.6	2.7

1 Source: Bank of Canada Review, June 1990
2 Province of Alberta Estimates

In 1989-90 the Government of Alberta's total scientific expenditures dropped by .6%, however, an increase of 9.5% has been estimated for 1990-91. The Department of Technology Research and Telecommunications, AOSTRA, and the Alberta Heritage Foundation for Medical Research account for 46% of the total scientific expenditures in 1989-90, and an estimated 51% in 1990-91.

TEXT TABLE II. Government of Alberta Scientific Expenditures by Selected Department or Agency, 1988-89 to 1990-91(e)

Selected Department or agency	1988-89	1989-90	1990-91(e)
	in millions of dollars		
Agriculture	20.8	20.7	20.8
Culture and Multiculturalism	19.0	22.8	22.3
Environment	6.6	4.0	4.2
Environmental Centre	11.1	11.0	11.6
Forestry, Lands and Wildlife	22.1	21.5	22.6
Alberta Heritage Foundation for Medical Research	37.6	30.8	36.1
AOSTRA	33.0	32.2	42.0
Technology, Research and Telecommunications	53.0	49.8	61.1
Transportation and Utilities	9.7	10.0	9.9
Other	35.8	44.5	40.2
TOTAL	**248.7**	**247.3**	**270.8**

In 1989-90, 80% of the total scientific expenditures were in the natural sciences; 73% of this total was for research and development. Technology, Research and Telecommunications reported over 33% of natural science R&D expenditures. In contrast, only 20% of the total scientific expenditures were carried out in the social sciences and humanities, 95% being related scientific activities. Culture and Multiculturalism reported over 41% of the social science RSA activities.

TEXT TABLE III. Government of Alberta Scientific Expenditures, by Activity and by Department or Agency, 1989-90

Department or agency	Natural Sciences			Social Sciences and Humanities		
	Research and development	Related scientific activities	Total	Research and development	Related scientific activities	Total
	in millions of dollars					
Agriculture	13.5	7.2	20.7	-	-	-
Culture and Multiculturalism	-	3.5	3.5	-	19.3	19.3
Environment	0.7	3.3	4.0	0.1	-	0.1
Environmental Centre	5.0	6.0	11.0	-	-	-
Forestry, Lands and Wildlife	4.4	17.1	21.5	-	-	-
Alberta Heritage Foundation for Medical Research	30.6	0.2	30.8	-	-	-
AOSTRA	27.9	4.3	32.2	-	-	-
Technology, Research and Telecommunications	48.8	1.0	49.8	-	-	-
Transportation and Utilities	2.1	7.4	9.5	-	0.5	0.5
Other	12.8	2.3	15.1	2.3	27.0	29.3
TOTAL	**145.8**	**52.3**	**198.1**	**2.4**	**46.8**	**49.2**

Turning to the performers of scientific expenditures, in 1989-90 provincial government activities accounted for 39.3% of the total. Industry reported 21.3%, and the Alberta Research Council reported 12.7%. Over 98% of the total scientific expenditures are current expenditures, with Administration of extramural programs and capital expenditures accounting for less than 2%.

Text Table IV. Government of Alberta Scientific Expenditures, by Activity and Performer, 1989-90

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council	Other	Total
	in millions of dollars						
Current expenditures:							
Research and development	18.4	40.4	42.7	2.8	30.1	8.4	142.8
Related scientific activities	69.8	12.1	3.6	0.1	1.4	8.5	95.5
Sub-total	88.2	52.5	46.3	2.9	31.5	16.9	238.3
Administration of extramural programs:							
Research and development	4.5	-	-	-	-	-	4.5
Related scientific activities	0.8	-	-	-	-	-	0.8
Sub-total	5.3	-	-	-	-	-	5.3
Capital expenditures:							
Research and development	0.9	-	-	-	-	-	0.9
Related scientific activities	2.7	-	-	-	-	-	2.7
Sub-total	3.6	-	-	-	-	-	3.6
TOTAL	**97.2**	**52.5**	**46.3**	**2.9**	**31.5**	**16.9**	**247.3**

Of the $52 million of provincial funds allocated to the industry sector, AOSTRA and Technology Research and Telecommunications, together accounted for 61% ($32 million) of these funds.

In this report, the scientific activity of the Alberta Research Council reflects only that portion funded by the government of Alberta. The Department of Technology Research and Telecommunications was the largest source, transferring approximately $25 million. Additional information on the activity of the Alberta Research Council is available in Science Statistics, Catalogue No 88-001, Vol 14, No 9.

Text Table V. Government of Alberta Scientific Expenditures, by Performer and Selected Departments, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council	Other	Total
	in millions of dollars						
Agriculture	14.0	0.9	1.9	-	-	3.9	20.7
Culture and Multiculturalism	17.6	-	-	-	-	5.2	22.8
Environment	2.1	0.6	—	-	0.3	1.0	4.0
Environment Centre	10.5	0.4	—	-	0.1	-	11.0
Forestry, Lands and Wildlife	15.5	4.9	0.2	-	0.6	0.3	21.5
Alberta Heritage Foundation for Medical Research	1.6	0.5	26.8	-	-	1.9	30.8
AOSTRA	4.9	16.8	4.9	-	4.4	1.2	32.2
Technology, Research and Telecommunications	0.5	15.3	8.6	0.4	24.6	0.4	49.8
Transportation and Utilities	8.5	0.5	0.1	-	0.3	0.6	10.0
Other	22.0	12.6	3.8	2.5	1.2	2.4	44.5
TOTAL	**97.2**	**52.5**	**46.3**	**2.9**	**31.5**	**16.9**	**247.3**

There were 1,978 person years engaged in provincial government scientific activities in 1989-90. Reported personnel costs for this period accounted for 71% of total intramural expenditures of $69 million. Technical personnel accounted for 42% of the total person years, and over 50% of the Natural Science employees. In the social sciences, 54% of the personnel were in the scientific and professional category, followed by technical (24%) and other (22%).

Text Table VI. Government of Alberta Personnel Engaged in Scientific Activities, by Department or Agency and and Category, 1989-90

Science type and activity	Scientific and professional	Technical	Other	Total
	(person-years)			
Natural sciences:				
R&D	149	144	36	329
RSA	284	527	118	929
AEP	37	16	50	103
Total	470	687	204	1,361
Social sciences:				
R&D	11	3	4	18
RSA	315	141	130	586
AEP	9	1	3	13
Total	335	145	137	617
All sciences:				
R&D	160	147	40	347
RSA	599	668	248	1,515
AEP	46	17	53	116
Total	805	832	341	1,978

The major applications of science expenditures are Industrial and Economic Development (21%), Social Development (18%), and Energy and Fuels (13%). Agriculture and Technology Research and Telecommunications are the primary supporters of Industrial and Economic Development, while Culture and Multiculturalism and AOSTRA are the main supporters of Social Development and Energy and Fuels.

Text Table VII. Objectives of the Government of Alberta Scientific Expenditures, 1989-90 to 1990-91(e)

Objective	1989-90		1990-91(e)	
	in millions of dollars	%	in millions of dollars	%
Advancement of science	8.3	3.4	7.8	2.9
Energy and fuels:				
Fossil Fuels	31.8	12.9	39.7	14.7
Other	1.3	0.5	2.0	0.7
Environmental issues:				
Air	1.3	0.5	1.5	0.6
Land	4.0	1.6	.9	0.3
Water	2.1	0.8	2.3	0.8
Other	5.7	2.3	6.3	2.3
Health	44.1	17.8	48.9	18.1
Industrial and economic development:				
Agriculture	20.7	8.4	23.6	8.7
Manufacturing	25.5	10.3	36.9	13.6
Other	5.9	2.4	7.2	2.7
Social development:				
Culture, sport & recreation	23.9	9.7	24.1	8.9
Education	4.8	1.9	3.8	1.4
Other	14.7	5.9	13.3	4.9
Transportation	11.0	4.5	10.4	3.9
All other	42.2	17.1	42.1	15.5
TOTAL	**247.3**	**100.0**	**270.8**	**100.0**

All Sciences

TABLE 1. Total Expenditures by Activity, 1982-83 to 1990-91(e)

Activity	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Research and development:									
Current expenditures:									
In-house	14,751	15,785	15,514	16,577	20,832	13,854	17,732	18,372	19,718
Contracts	51,969	46,658	84,980	56,102	88,099	41,598	29,275	24,207	38,527
Grants	62,699	80,923	83,575	104,811	141,860	108,313	94,012	99,786	113,980
Research fellowships	306	503	533	453	433	958	150	414	570
Administration of extramural R&D programs	...	...	...	...	...	7,451	8,521	4,499	4,318
Sub-total	129,725	143,869	184,602	177,943	251,224	172,174	149,690	147,278	177,113
Capital expenditures	8,030	11,411	2,398	1,174	698	522	427	963	781
Related scientific activities:									
Current expenditures	69,138	75,539	78,141	86,686	77,987	79,144	95,267	95,557	90,706
Administration of extramural RSA programs	...	...	...	...	...	563	937	788	939
Sub-total	69,138	75,539	78,141	86,686	77,987	79,707	96,204	96,345	91,645
Capital expenditures	5,935	8,049	11,573	6,575	3,518	1,770	2,337	2,676	1,233
TOTAL	**212,828**	**238,868**	**276,714**	**272,378**	**333,427**	**254,173**	**248,658**	**247,262**	**270,772**

Chart 1. Total Expenditures

by Activity, 1982-83 to 1990-91(e)

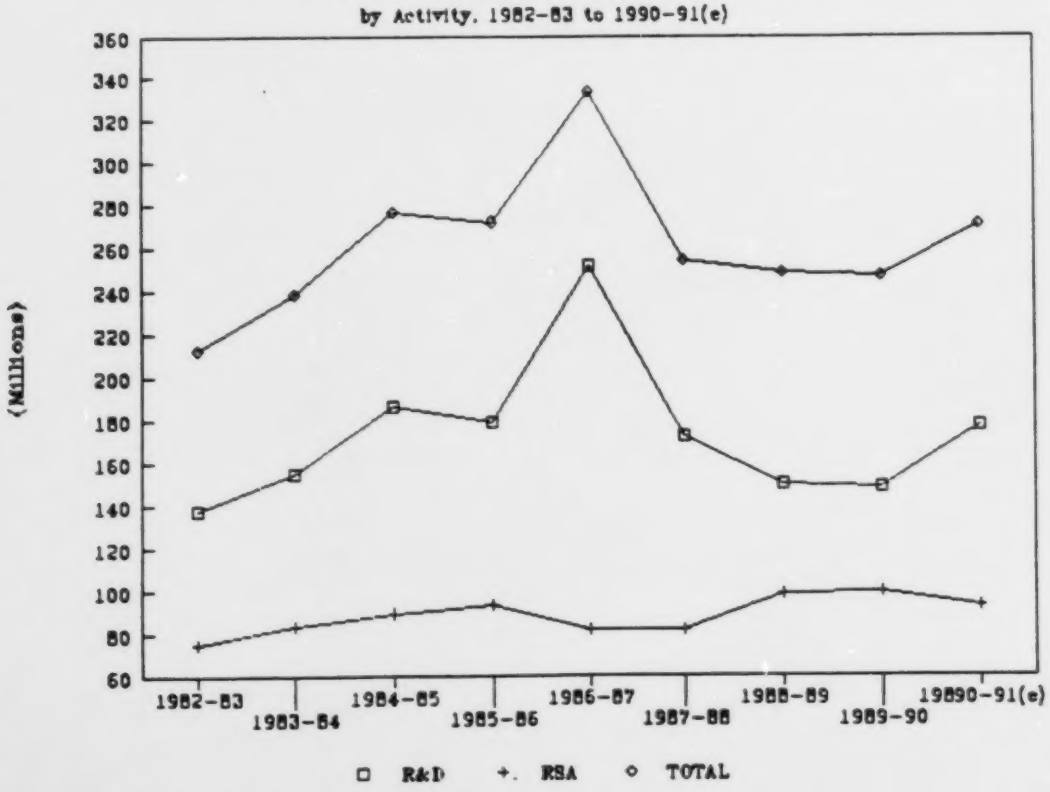

TABLE 2. Total Expenditures by Department or Agency, 1982-83 to 1990-91(e)

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Access Network	200[e]	398	350	350	350	385	367	205	160
Advanced Education	...	1,354	1,639	2,150	1,783	1,561	2,176	2,647	2,658
Advanced Education and Manpower	2,612	...	...	...	...	...	...	...	...
Agricultural Research Trust	373	369	414	391	410	467	...	...	...
Agriculture	16,391	19,532	19,272	19,787	17,153	17,626	20,776	20,688	20,841
Alcoholism and Drug Abuse Commission	264	320	308	524	584	396	577	759	592
Attorney General	290	436	407	363	363	326	300	300	303
Career Development and Employment	...	...	...	...	1,863	1,716	1,588	1,654	1,670
Community and Occupational Health	...	...	...	...	986	1,510	...	...	...
Consumer and Corporate Affairs	143	172	157	154	174	191	98	...	...
Culture and Multiculturalism	17,058	22,313	26,628	21,689	19,598	18,695	19,013	22,818	22,299
Economic Development	4,093	3,374	3,180	4,418	...	...	...	...	...
Economic Development and Trade	...	...	...	...	5,740	5,391	3,478	3,212	3,164
Education	3,617[e]	2,724	3,019	3,068	2,507	1,728	2,139	2,114	1,792
Energy	...	...	...	...	7,917	6,248	4,527	8,713	6,863
Energy and Natural Resources	25,210	28,509	19,622	15,197	...	...	...	...	...
Environment	9,687	13,109	15,344	16,748	16,484	14,590	6,556	4,044	4,158
Environmental Centre	10,528	11,605	11,330	12,286	11,712	11,076	11,126	11,032	11,607
Environment Council	1,243	1,525	1,176	1,060	1,245	1,016	939	1,043	1,243
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...	...
Family and Social Services	...	...	...	...	421	579	629	814	1,095
Forestry, Lands and Wildlife	...	...	...	...	8,760	6,715	22,092	21,471	22,593
Health	...	...	...	...	...	...	5,788	6,947	7,184
Alberta Heritage Foundation for Medical Research	21,588	27,562	32,748	43,878	56,930	51,167	37,623	30,812	36,076
Hospitals and Medical Care(1)	19,502	22,253	20,205	23,621	24,690	4,690	...	...	...
Housing and Public Works	...	...	...	...	...	...	...	...	...
Housing	805	1,206	1,735	2,401	...	...	...	...	...
Labour	1,105	1,047	1,067	1,239	1,242	1,132	1,339	1,613	1,760
Manpower	...	1,539	1,412	1,999	...	...	...	...	...
Mental Health Research Fund(2)	386	754	729	873	700	624	...	...	...
Municipal Affairs	1,408	1,577	1,037	870	3,544	3,583	3,922	4,040	3,853
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	32,957	32,226	42,040
Occupational Health and Safety	...	...	...	...	...	...	567	1,599	908
Recreation and Parks	940	535	882	515	431	488	1,044	277	137
Social Services and Community Health	400	463	507	5,481	...	...	...	...	...
Solicitor General	3,478	4,434	4,521	2,234	1,617	1,892	2,526	5,040	2,536
Special Waste Management Corporation	...	...	...	...	...	...	...	160	168
Technology, Research and Telecommunications	...	...	...	...	55,092	51,297	53,000	49,813	61,128
Tourism	...	...	...	...	637	759	1,920	1,296	1,763
Tourism and Small Business	1,597	1,058	713	882	...	...	...	...	...
Transportation and Utilities	6,816	6,892	6,460	7,479	9,310	10,017	9,659	9,953	9,921
Treasury	1,994	2,097	2,094	2,172	2,267	2,009	1,932	1,972	2,260
Workers' Health, Safety and Compensation	847	1,122	1,163	1,532	...	...	...	...	...
TOTAL	**212,828**	**238,868**	**276,714**	**272,378**	**333,427**	**254,173**	**248,658**	**247,262**	**270,772**

(1) Grants to hospitals for Applied Heart Research not included in departmental budget as of 1987-88.
(2) Included with Department of Health as of 1988-89.

TABLE 3. Total Expenditures by Performer, 1982-83 to 1990-91(e)

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Intramural	79,999	93,257	92,106	89,309	87,541	87,408	95,859	97,202	96,858
Industry	44,502	42,623	78,256	57,643	91,306	50,688	48,886	52,510	74,092
Universities	39,242	41,827	45,776	58,824	91,183	69,535	54,774	46,297	48,970
Hospitals and health organizations	11,191	16,711	15,320	18,835	18,710	730	1,423	2,913	2,483
Alberta Research Council(1)	32,354	35,043	38,602	39,229	33,765	33,085	31,416	31,481	31,193
Other	5,540	9,407	6,654	8,538	10,922	12,727	16,300	16,859	17,176
TOTAL	**212,828**	**238,868**	**276,714**	**272,378**	**333,427**	**254,173**	**248,658**	**247,262**	**270,772**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 4. Total Expenditures on R&D by Performer, 1982-83 to 1990-91(e)

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Intramural	22,834	27,411	18,277	18,156	22,313	21,997	26,943	23,834	24,817
Industry	32,579	32,207	68,697	44,442	82,912	44,087	34,781	40,387	63,998
Universities	36,842	39,975	43,508	55,451	89,463	68,250	48,313	42,747	46,272
Hospitals and health organizations	11,191	16,646	15,244	18,825	18,710	730	1,383	2,802	2,463
Alberta Research Council(1)	31,184	33,370	37,297	38,127	31,021	31,941	29,943	30,108	31,166
Other	3,125	5,671	3,977	4,366	7,503	5,691	8,754	8,363	9,178
TOTAL	**137,755**	**155,280**	**187,000**	**179,367**	**251,922**	**172,696**	**150,117**	**148,241**	**177,894**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 5. Total Expenditures on R&D by Department or Agency, 1982-83 to 1990-91(e)

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Access Network	7[e]	-	31	31	31	-	-	-	-
Advanced Education	...	19	65	488	462	472	238	176	176
Agricultural Research Trust	373	369	414	391	410	467	...	...	...
Agriculture	13,699	15,782	11,937	12,471	10,153	9,820	13,315	13,482	13,341
Alcoholism and Drug Abuse Commission	7	1	1	-	-	-	-	67	91
Attorney General	290	436	407	363	363	326	300	300	303
Career Development and Employment	...	...	...	...	-	-	19	-	-
Community and Occupational Health	...	...	...	...	234	818	...	...	...
Culture and Multiculturalism	296	773	1,464	1,464	4,211	-	-	-	-
Education	295[e]	302	324	526	1,376	753	471	363	281
Energy	...	...	...	...	7,235	5,461	4,409	8,040	6,769
Energy and Natural Resources	16,412	20,318	12,776	7,618	...	...	...	...	...
Environment	3,558	3,949	4,467	4,949	5,159	4,033	821	762	710
Environmental Centre	4,007	4,399	4,369	4,947	5,373	5,103	5,670	5,028	5,529
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...	...
Family and Social Services	...	...	...	...	20	190	367	474	804
Forestry, Lands and Wildlife	...	...	...	...	3,244	3,079	3,972	4,341	4,649
Health	...	...	...	...	...	...	3,094	3,806	4,021
Alberta Heritage Foundation for Medical Research	20,659	26,656	31,901	43,007	56,475	50,919	37,365	30,579	35,750
Hospitals and Medical Care(1)	16,976	19,880	17,836	21,232	22,191	2,285	...	...	...
Housing	385	370	775	958	...	...	...	...	...
Manpower	...	90	-	-	...	...	...	...	...
Mental Health Research Fund(2)	386	754	729	873	700	624	...	...	...
Municipal Affairs	68	53	-	-	1,088	1,025	641	1,178	1,010
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	30,235	27,962	42,040
Occupational Health and Safety	...	...	...	...	...	...	175	794	136
Recreation and Parks	-	27	-	-	-	-	25	-	-
Technology, Research and Telecommunications	...	...	...	...	52,854	49,329	45,509	48,760	60,207
Tourism	...	...	...	...	-	48	1,745	-	-
Transportation and Utilities	13	66	762	642	1,426	1,645	1,746	2,129	2,077
Treasury	-	-	-	-	-	-	-	-	-
Workers' Health, Safety and Compensation	71	447	147	390	...	...	...	...	...
TOTAL	**137,755**	**155,280**	**187,000**	**179,367**	**251,922**	**172,696**	**150,117**	**148,241**	**177,894**

(1) Grants to hospitals for Applied Heart Research not included in departmental budget after 1987-88.
(2) Included with Department of Health as of 1988-89.

TABLE 6. Departmental Personnel Engaged in Scientific Activities by Activity and Category, 1982-83 to 1990-91(e)

Activity and category	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	(person-years)								
Research and development:									
Scientific and professional ..	174	175	190	207	224	136	150	160	173
Technical	132	137	148	145	159	162	152	147	146
Other	53	57	68	66	70	45	47	40	49
Sub-total	359	369	406	418	453	343	349	347	368
Related scientific activities:									
Scientific and professional ..	451	595	728	721	630	606	570	599	586
Technical	286	432	624	589	529	567	692	668	670
Other	187	206	264	249	232	227	232	248	233
Sub-total	924	1,233	1,616	1,559	1,391	1,400	1,494	1,515	1,489
Administration of extramural programs:									
Scientific and professional ..	...	...	...	...	...	67	53	46	45
Technical	...	...	...	...	...	6	17	17	17
Other	...	...	...	...	...	56	58	53	52
Sub-total	...	...	...	...	...	129	128	116	114
Total scientific activities:									
Scientific and professional ..	625	770	918	928	854	809	773	805	804
Technical	418	569	772	734	688	735	861	832	833
Other	240	263	332	315	302	328	337	341	334
TOTAL	**1,283**	**1,602**	**2,022**	**1,977**	**1,844**	**1,872**	**1,971**	**1,978**	**1,971**

Chart 2. Personnel Engaged by Activity and Category, 1982-83 to 1990-91(e)

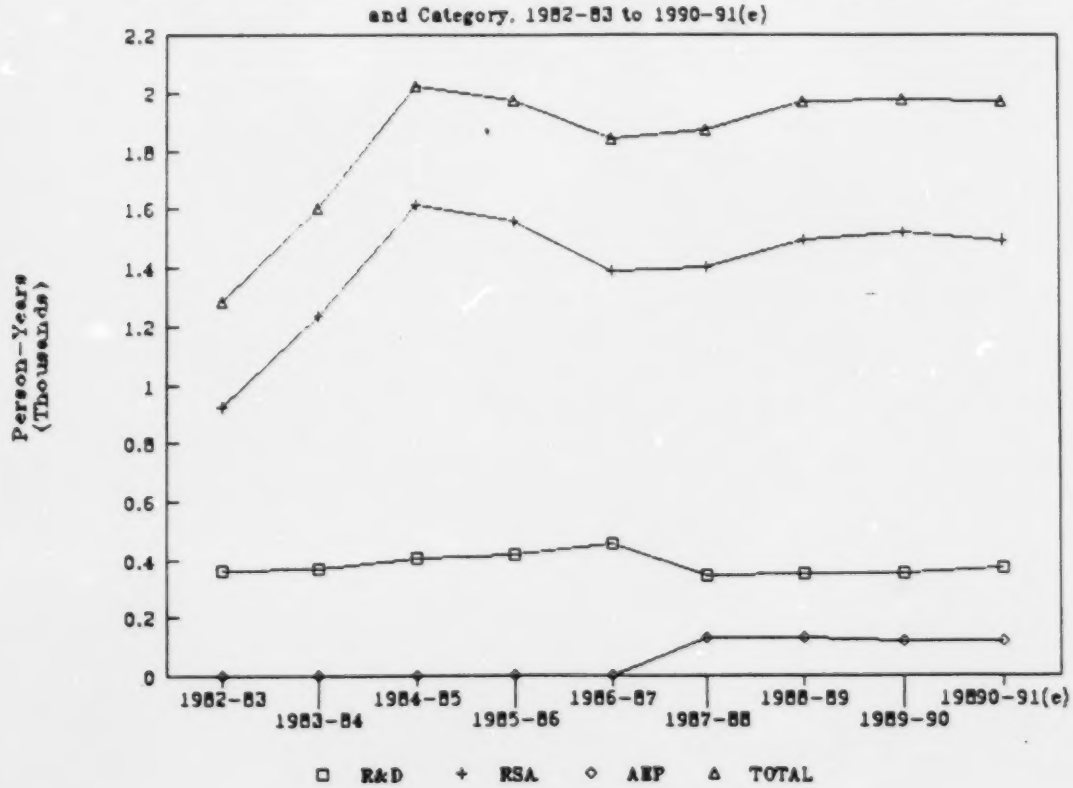

TABLE 7. Total Expenditures by Sources of Funds, 1989-90

Department or agency	Departmental budget	Other departments	Federal government	Trust funds	Other sources	Total
	in thousands of dollars					
Access Network	136	11	41	17	-	205
Advanced Education	2,647	-	-	-	-	2,647
Agriculture	15,688	-	-	5,000	-	20,688
Alcoholism and Drug Abuse Commission	692	-	67	-	-	759
Attorney General	300	-	-	-	-	300
Career Development and Employment	1,654	-	-	-	-	1,654
Culture and Multiculturalism	22,818	-	-	-	-	22,818
Economic Development and Trade	3,212	-	-	-	-	3,212
Education	2,114	-	-	-	-	2,114
Energy	8,713	-	-	-	-	8,713
Environment	3,564	-	-	480	-	4,044
Environmental Centre	10,800	-	-	34	198	11,032
Environment Council	1,043	-	-	-	-	1,043
Family and Social Services	814	-	-	-	-	814
Forestry, Lands and Wildlife	21,069	146	182	74	-	21,471
Health	4,201	-	37	2,709	-	6,947
Alberta Heritage Foundation for Medical Research	-	612	-	-	30,200	30,812
Labour	1,613	-	-	-	-	1,613
Municipal Affairs	4,040	-	-	-	-	4,040
AOSTRA	3,413	-	-	28,813	-	32,226
Occupational Health and Safety	415	-	-	769	415	1,599
Recreation and Parks	227	-	-	-	50	277
Solicitor General	5,020	-	-	-	20	5,040
Special Waste Management Corporation	160	-	-	-	-	160
Technology, Research and Telecommunication	49,813	-	-	-	-	49,813
Tourism	1,296	-	-	-	-	1,296
Transportation and Utilities	9,953	-	-	-	-	9,953
Treasury	1,972	-	-	-	-	1,972
TOTAL	177,387	769	327	37,896	30,883	247,262

Chart 3. Total Expenditures

by Sources of Funds, 1989-90

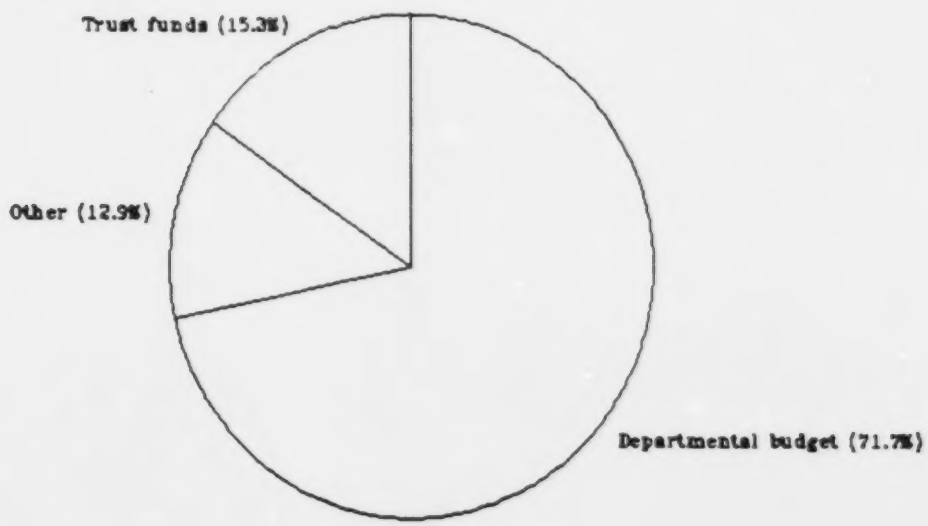

TABLE 8. Total Expenditures by Activity and Performer, 1989-90

Activity	Intramural	Industry	Universities	Hospitals and health organisations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Research and development:							
Current expenditures:							
In-house	18,372	...	...	...	...	...	18,372
Contracts	-	17,871	236	34	4,761	1,305	24,207
Grants	...	22,516	42,217	2,768	25,227	7,058	99,786
Research fellowships	-	-	294	-	120	-	414
Administration of extramural R&D programs	4,499	...	...	...	...	...	4,499
Sub-total	22,871	40,387	42,747	2,802	30,108	8,363	147,278
Capital expenditures	963	...	...	...	...	...	963
Related scientific activities:							
Current expenditures	69,904	12,123	3,550	111	1,373	8,496	95,557
Administration of extramural RSA programs	788	...	...	...	...	...	788
Sub-total	70,692	12,123	3,550	111	1,373	8,496	96,345
Capital expenditures	2,676	...	...	...	...	...	2,676
TOTAL	**97,202**	**52,510**	**46,297**	**2,913**	**31,481**	**16,859**	**247,262**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

Chart 4. Total Expenditures by Sector

of Performer and Activity, 1989-90

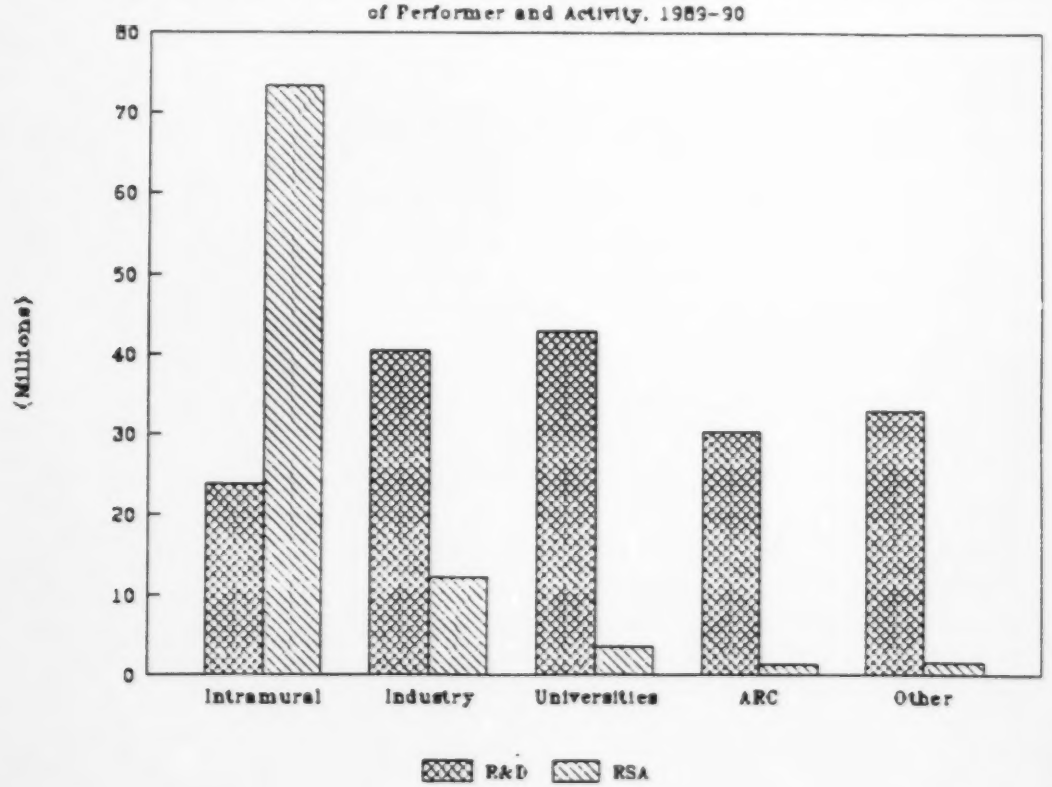

TABLE 9. Total Expenditures by Department or Agency and Performer, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Access Network	205	-	-	-	-	-	205
Advanced Education	486	-	1,261	-	-	900	2,647
Agriculture	14,044	867	1,914	-	-	3,863	20,688
Alcoholism and Drug Abuse Commission	759	-	-	-	-	-	759
Attorney General	-	-	300	-	-	-	300
Career Development and Employment	1,237	213	7	-	-	197	1,654
Culture and Multiculturalism	17,652	-	-	-	-	5,166	22,818
Economic Development and Trade	2,706	494	5	-	-	7	3,212
Education	1,418	104	260	-	5	327	2,114
Energy	1,019	5,802	484	-	1,189	219	8,713
Environment	2,118	641	30	-	287	968	4,044
Environmental Centre	10,534	364	44	-	90	-	11,032
Environment Council	1,043	-	-	-	-	-	1,043
Family and Social Services	572	104	20	-	-	118	814
Forestry, Lands and Wildlife	15,457	4,864	196	-	621	333	21,471
Health	2,847	504	1,155	1,959	-	482	6,947
Alberta Heritage Foundation for Medical Research	1,569	500	26,811	-	-	1,932	30,812
Labour	1,498	115	-	-	-	-	1,613
Municipal Affairs	3,326	575	75	-	-	64	4,040
AOSTRA	4,934	16,775	4,856	-	4,432	1,229	32,226
Occupational Health and Safety	755	155	105	584	-	-	1,599
Recreation and Parks	227	50	-	-	-	-	277
Solicitor General	1,550	3,490	-	-	-	-	5,040
Special Waste Management Corporation	18	142	-	-	-	-	160
Technology, Research and Telecommunications	495	15,315	8,659	370	24,570	404	49,813
Tourism	591	630	-	-	-	75	1,296
Transportation and Utilities	8,516	460	115	-	287	575	9,953
Treasury	1,626	346	-	-	-	-	1,972
TOTAL	**97,202**	**52,510**	**46,297**	**2,913**	**31,481**	**16,859**	**247,262**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 10. Total Expenditures by Department or Agency and Activity, 1989-90

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP(1)	Capital	Current	AEP(1)	Capital	
	in thousands of dollars						
Access Network	-	-	-	188	-	17	205
Advanced Education	172	4	-	2,467	4	-	2,647
Agriculture	12,946	536	-	7,206	-	-	20,688
Alcoholism and Drug Abuse Commission	67	-	-	692	-	-	759
Attorney General	300	-	-	-	-	-	300
Career Development and Employment	-	-	-	1,654	-	-	1,654
Culture and Multiculturalism	-	-	-	21,447	-	1,371	22,818
Economic Development and Trade	-	-	-	3,140	26	46	3,212
Education	312	50	1	1,546	200	5	2,114
Energy	7,107	923	10	673	-	-	8,713
Environment	683	79	-	3,267	-	15	4,044
Environmental Centre	4,618	99	311	5,639	-	365	11,032
Environment Council	-	-	-	1,043	-	-	1,043
Family and Social Services	439	-	35	340	-	-	814
Forestry, Lands and Wildlife	4,131	160	50	16,576	254	300	21,471
Health	3,771	25	10	3,027	45	69	6,947
Alberta Heritage Foundation for Medical Research	29,015	1,564	-	228	5	-	30,812
Labour	-	-	-	1,613	-	-	1,613
Municipal Affairs	537	420	221	2,776	86	-	4,040
AOSTRA	27,732	227	3	4,264	-	-	32,226
Occupational Health and Safety	694	100	-	805	-	-	1,599
Recreation and Parks	-	-	-	277	-	-	277
Solicitor General	-	-	-	5,040	-	-	5,040
Special Waste Management Corporation	-	-	-	142	18	-	160
Technology, Research and Telecommunications	48,493	267	-	1,053	-	-	49,813
Tourism	-	-	-	1,161	135	-	1,296
Transportation and Utilities	1,762	45	322	7,400	15	409	9,953
Treasury	-	-	-	1,893	-	79	1,972
TOTAL	**142,779**	**4,499**	**963**	**95,557**	**788**	**2,676**	**247,262**

(1) Administration of extramural programs.

TABLE 11. Total Expenditures on R&D by Department or Agency and Performer, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Advanced Education	4	-	72	-	-	100	176
Agriculture	7,438	267	1,914	-	-	3,863	13,482
Alcohol and Drug Abuse Commission	67	-	-	-	-	-	67
Attorney General	-	-	300	-	-	-	300
Education	251	-	25	-	5	82	363
Energy	933	5,725	484	-	729	169	8,040
Environment	179	321	-	-	262	-	762
Environmental Centre	4,649	348	31	-	-	-	5,028
Family and Social Services	355	104	15	-	-	-	474
Forestry, Lands and Wildlife	2,274	1,074	159	-	621	213	4,341
Health	395	-	1,092	1,868	-	451	3,806
Alberta Heritage Foundation for Medical Research	1,564	500	26,605	-	-	1,910	30,579
Municipal Affairs	641	462	75	-	-	-	1,178
AOSTRA	3,640	16,275	3,413	-	3,634	1,000	27,962
Occupational Health and Safety	125	-	105	564	-	-	794
Technology, Research and Telecommunications	267	15,211	8,342	370	24,570	-	48,760
Transportation and Utilities	1,052	100	115	-	287	575	2,129
TOTAL	**23,834**	**40,387**	**42,747**	**2,802**	**30,108**	**8,363**	**148,241**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 12. Intramural Expenditures by Department or Agency and Type of Expenditure, 1989-90

Department or agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	in thousands of dollars			
Access Network	80	108	17	205
Advanced Education	478	8	-	486
Agriculture	9,420	4,624	-	14,044
Alcoholism and Drug Abuse Commission	458	301	-	759
Career Development and Employment	1,117	120	-	1,237
Culture and Multiculturalism	10,895	5,386	1,371	17,652
Economic Development and Trade	2,000	660	46	2,706
Education	1,240	172	6	1,418
Energy	969	40	10	1,019
Environment	1,658	445	15	2,118
Environmental Centre	7,414	2,444	676	10,534
Environment Council	791	252	-	1,043
Family and Social Services	504	33	35	572
Forestry, Lands and Wildlife	12,182	2,925	350	15,457
Health	2,568	200	79	2,847
Alberta Heritage Foundation for Medical Research	566	1,003	-	1,569
Labour	1,392	106	-	1,498
Municipal Affairs	2,371	734	221	3,326
AOSTRA	2,480	2,451	3	4,934
Occupational Health and Safety	610	145	-	755
Recreation and Parks	186	41	-	227
Solicitor General	1,550	-	-	1,550
Special Waste Management Corporation	15	3	-	18
Technology, Recreation and Telecommunications	293	202	-	495
Tourism	508	83	-	591
Transportation and Utilities	5,897	1,888	731	8,516
Treasury	1,322	225	79	1,626
TOTAL	**68,964**	**24,599**	**3,639**	**97,202**

TABLE 13. Departmental Personnel Engaged in Scientific Activities, 1989-90

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	-	-	2
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	57	84	-	141	116	156	-	272
Alcoholism and Drug Abuse Commission	-	2	-	2	6	3	2	11
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	117	111	64	292
Economic Development and Trade	-	-	-	-	37	2	7	46
Education	2	-	-	2	8	3	4	15
Energy	-	-	-	-	2	-	-	2
Environment	2	1	-	3	18	32	3	53
Environmental Centre	25	43	20	88	35	61	29	125
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	6	-	-	6	5	1	-	6
Forestry, Lands and Wildlife	34	14	3	51	33	182	28	243
Health	5	1	4	10	28	6	14	48
Labour	-	-	-	-	23	1	8	32
Municipal Affairs	4	-	-	4	31	-	12	43
AOSTRA	19	-	12	31	6	-	6	12
Occupational Health and Safety	1	-	-	1	8	3	4	15
Recreation and Parks	-	-	-	-	4	3	-	7
Solicitor General	-	-	-	-	12	26	-	38
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	-	-	-	-	4	-	-	4
Tourism	-	-	-	-	9	1	3	13
Transportation and Utilities	5	2	1	8	33	71	42	146
Treasury	-	-	-	-	24	2	8	34
TOTAL	**160**	**147**	**40**	**347**	**599**	**668**	**248**	**1,515**

TABLE 13. Departmental Personnel Engaged in Scientific Activities, 1989-90 - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	-	-	2
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	2	2	8	12	175	242	8	425
Alcoholism and Drug Abuse Commission	-	-	-	-	6	5	2	13
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	117	111	64	292
Economic Development and Trade	-	-	1	1	37	2	8	47
Education	4	1	1	6	14	4	5	23
Energy	7	-	5	12	9	-	5	14
Environment	3	-	1	4	23	33	4	60
Environmental Centre	2	-	1	3	62	104	50	216
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	-	-	-	-	11	1	-	12
Forestry, Lands and Wildlife	12	14	18	44	79	210	49	338
Health	1	-	-	1	34	7	18	59
Alberta Heritage Foundation for Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	23	1	8	32
Municipal Affairs	1	-	4	5	36	-	16	52
AOSTRA	1	-	1	2	26	-	19	45
Occupational Health and Safety	2	-	-	2	11	3	4	18
Recreation and Parks	-	-	-	-	4	3	-	7
Solicitor General	-	-	-	-	12	26	-	38
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	2	-	-	2	6	-	-	6
Tourism	4	-	1	5	13	1	4	18
Transportation and Utilities	1	-	1	2	39	73	44	156
Treasury	-	-	-	-	24	2	8	34
TOTAL	**46**	**17**	**53**	**116**	**805**	**832**	**341**	**1,978**

TABLE 14. Objectives of Expenditures by Department or Agency, 1989-90

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	in thousands of dollars								
Access Network	-	-	-	-	-	-	-	-	-
Advanced Education	100	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-
Alcoholism and Drug Abuse Commission	-	-	-	-	-	-	-	-	-
Attorney General	-	-	-	-	-	-	-	-	-
Career Development and Employment	-	-	-	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-	-	-	-
Economic Development and Trade	-	-	-	-	-	-	-	-	-
Education	-	-	-	-	-	-	-	-	-
Energy	-	339	7,758	616	-	-	-	-	-
Environment	90	-	-	-	-	413	917	405	2,219
Environmental Centre	-	139	-	-	-	875	3,021	1,730	16
Environment Council	-	-	-	-	-	-	-	-	1,043
Family and Social Services	-	-	-	-	-	-	-	-	-
Forestry, Lands and Wildlife	1	-	-	-	-	-	18	-	2,417
Health	-	-	-	-	-	6	-	-	-
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	-	-	-	-
AOSTRA	8,154	-	24,072	-	-	-	-	-	-
Occupational Health and Safety	-	-	-	-	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-	-	12	-
Solicitor General	-	-	-	-	-	-	-	-	-
Special Waste Management Corporation	-	-	-	-	160	-	-	-	-
Technology, Research and Telecommunications	-	-	-	-	-	-	-	-	-
Tourism	-	-	-	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-	-	-
TOTAL	**8,345**	**478**	**31,830**	**616**	**160**	**1,294**	**3,956**	**2,147**	**5,695**

TABLE 14. Objectives of Expenditures by Department or Agency, 1989-90 - Continued

Department or agency	Health	Industrial and economic development				
		Agriculture	Fisheries	Forestry	Manufacturing	Other
	in thousands of dollars					
Access Network	-	-	-	66	-	-
Advanced Education	-	-	-	-	-	-
Agriculture	-	20,688	-	-	-	-
Alcoholism and Drug Abuse Commission	759	-	-	-	-	-
Attorney General	-	-	-	-	-	-
Career Development and Employment	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-
Economic Development and Trade	-	-	-	-	590	1,530
Education	-	-	-	-	-	-
Energy	-	-	-	-	-	-
Environment	-	-	-	-	-	-
Environmental Centre	3,678	-	-	-	-	-
Environment Council	-	-	-	-	-	-
Family and Social Services	-	-	-	-	-	-
Forestry, Lands and Wildlife	-	-	316	1,959	-	-
Health	6,904	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	30,812	-	-	-	-	-
Labour	-	-	-	-	-	623
Municipal Affairs	-	-	-	-	-	1,377
AOSTRA	-	-	-	-	-	-
Occupational Health and Safety	1,599	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-
Solicitor General	-	-	-	-	-	-
Special Waste Management Corporation	-	-	-	-	-	-
Technology, Research and Telecommunications	370	-	-	-	24,873	-
Tourism	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-
Treasury	-	-	-	-	-	-
TOTAL	**44,122**	**20,688**	**316**	**2,025**	**25,463**	**3,530**

TABLE 14. Objectives of Expenditures by Department or Agency, 1989-90 - Concluded

Department or agency	Social development					Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human resources	Urban and regional studies	Other				
	in thousands of dollars								
Access Network	63	76	-	-	-	-	-	-	205
Advanced Education	-	2,475	-	-	72	-	-	-	2,647
Agriculture	-	-	-	-	-	-	-	-	20,688
Alcoholism and Drug Abuse Commission	-	-	-	-	-	-	-	-	759
Attorney General	-	-	-	-	300	-	-	-	300
Career Development and Employment	-	-	1,654	-	-	-	-	-	1,654
Culture and Multiculturalism	22,818	-	-	-	-	-	-	-	22,818
Economic Development and Trade	-	-	-	-	-	1,092	-	-	3,212
Education	-	2,114	-	-	-	-	-	-	2,114
Energy	-	-	-	-	-	-	-	-	8,713
Environment	-	-	-	-	-	-	-	-	4,044
Environmental Centre	783	-	-	-	-	-	790	-	11,032
Environment Council	-	-	-	-	-	-	-	-	1,043
Family and Social Services	-	130	80	-	604	-	-	-	814
Forestry, Lands and Wildlife	-	-	-	-	-	-	2,005	14,755	21,471
Health	-	37	-	-	-	-	-	-	6,947
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	30,812
Labour	-	-	939	-	51	-	-	-	1,613
Municipal Affairs	-	-	-	2,663	-	-	-	-	4,040
AOSTRA	-	-	-	-	-	-	-	-	32,226
Occupational Health and Safety	-	-	-	-	-	-	-	-	1,599
Recreation and Parks	215	-	-	-	-	-	-	50	277
Solicitor General	-	-	-	-	5,040	-	-	-	5,040
Special Waste Management Corporation	-	-	-	-	-	-	-	-	160
Technology, Research and Telecommunications	-	-	-	-	-	-	-	24,570	49,813
Tourism	-	-	-	-	1.296	-	-	-	1,296
Transportation and Utilities	-	-	-	-	-	9,953	-	-	9,953
Treasury	-	-	-	-	1,972	-	-	-	1,972
TOTAL	**23,879**	**4,832**	**2,673**	**2,663**	**9,335**	**11,045**	**2,795**	**39,375**	**247,262**

TABLE 15. Objectives of Expenditures by Activity, 1989–90

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	in thousands of dollars				
Advancement of science	–	–	8,345	–	8,345
Energy and fuels:					
Conservation	280	13	185	–	478
Fossil fuels	4,432	1,367	22,474	3,557	31,830
Renewable resources	–	–	616	–	616
Other	–	18	–	142	160
Environmental issues:					
Air	372	765	95	62	1,294
Land	1,385	1,717	493	361	3,956
Water	513	1,371	163	100	2,147
Other	1,257	2,838	374	1,226	5,695
Health	3,174	6,307	33,586	1,055	44,122
Industrial and economic development:					
Agriculture	7,438	6,606	6,044	600	20,688
Fisheries	106	167	–	43	316
Forestry	150	116	1,343	416	2,025
Manufacturing	267	643	23,553	1,000	25,463
Other	641	2,179	537	173	3,530
Social development:					
Culture, sport and recreation	606	18,107	–	5,166	23,879
Education	255	1,737	112	2,728	4,832
Human resources	–	2,192	–	481	2,673
Urban and regional studies .	–	2,599	–	64	2,663
Other	355	3,892	491	4,597	9,335
Transportation	1,052	8,285	1,077	631	11,045
Wildlife	1,045	1,150	100	500	2,795
Other	506	11,299	24,819	2,751	39,375
TOTAL	**23,834**	**73,368**	**124,407**	**25,653**	**247,262**

TABLE 16. Total Expenditures by Activity and Performer, 1990-91 Estimates

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Research and development:							
Current expenditures:							
In-house	19,718	...	...	...	...	...	19,718
Contracts	-	31,210	272	125	5,650	1,270	38,527
Grants	...	32,788	45,550	2,338	25,396	7,908	113,980
Research fellowships	-	-	450	-	120	-	570
Admistration of extramural R&D programs	4,318	...	...	...	...	...	4,318
Sub-total	24,036	63,998	46,272	2,463	31,166	9,178	177,113
Capital expenditures	781	...	...	...	...	...	781
Related scientific activities:							
Current expenditures	69,869	10,094	2,698	20	27	7,998	90,706
Administration of extramural RSA programs	939	...	...	...	...	...	939
Sub-total	70,808	10,094	2,698	20	27	7,998	91,645
Capital expenditures	1,233	...	...	...	...	...	1,233
TOTAL	**96,858**	**74,092**	**48,970**	**2,483**	**31,193**	**17,176**	**270,772**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 17. Total Expenditures by Department or Agency and Performer, 1990-91 Estimates

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Access Network	160	-	-	-	-	-	160
Advanced Education	497	-	1,989	72	-	100	2,658
Agriculture	14,400	841	1,800	-	-	3,800	20,841
Alcoholism and Drug Abuse Commission	592	-	-	-	-	-	592
Attorney General	-	-	303	-	-	-	303
Career Development and Employment	1,195	379	6	-	-	90	1,670
Culture and Multiculturalism	17,075	-	-	-	-	5,224	22,299
Economic Development and Trade	2,449	680	-	-	-	35	3,164
Education	1,134	115	63	-	32	448	1,792
Energy	889	3,695	571	-	946	762	6,863
Environment	2,305	745	30	-	90	988	4,158
Environmental Centre	11,062	450	-	-	95	-	11,607
Environment Council	1,243	-	-	-	-	-	1,243
Family and Social Services	847	100	24	-	-	124	1,095
Forestry, Lands and Wildlife	15,832	4,629	179	-	800	1,153	22,593
Health	2,954	550	984	2,021	-	675	7,184
Alberta Heritage Foundation for Medical Research	1,765	500	31,681	-	-	2,130	36,076
Labour	1,390	370	-	-	-	-	1,760
Municipal Affairs	2,873	840	75	-	-	65	3,853
AOSTRA	3,700	29,653	3,202	-	4,360	1,125	42,040
Occupational Health and Safety	693	105	90	20	-	-	908
Recreation and Parks	137	-	-	-	-	-	137
Solicitor General	1,367	1,169	-	-	-	-	2,536
Special Waste Management Corporation	18	150	-	-	-	-	168
Technology, Research and Telecommunications	800	27,540	7,848	370	24,570	-	61,128
Tourism	853	910	-	-	-	-	1,763
Transportation and Utilities	8,714	325	125	-	300	457	9,921
Treasury	1,914	346	-	-	-	-	2,260
TOTAL	**96,858**	**74,092**	**48,970**	**2,483**	**31,193**	**17,176**	**270,772**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 18. Total Expenditures by Department or Agency and Activity, 1990-91 Estimates

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP(1)	Capital	Current	AEP(1)	Capital	
	in thousands of dollars						
Access Network	-	-	-	150	-	10	160
Advanced Education	172	4	-	2,478	4	-	2,658
Agriculture	12,841	500	-	7,500	-	-	20,841
Alcoholism and Drug Abuse Commission	91	-	-	501	-	-	592
Attorney General	303	-	-	-	-	-	303
Career Development and Employment	-	-	-	1,670	-	-	1,670
Culture and Multiculturalism	-	-	-	22,299	-	-	22,299
Economic Development and Trade	-	-	-	3,116	23	25	3,164
Education	240	40	1	1,306	200	5	1,792
Energy	5,974	778	17	94	-	-	6,863
Environment	630	80	-	3,372	-	76	4,158
Environmental Centre	5,159	105	265	5,768	-	310	11,607
Environment Council	-	-	-	1,243	-	-	1,243
Family and Social Services	779	-	25	291	-	-	1,095
Forestry, Lands and Wildlife	4,314	160	175	17,364	280	300	22,593
Health	3,986	25	10	3,011	60	92	7,184
Alberta Heritage Foundation for Medical Research	33,990	1,760	-	321	5	-	36,076
Labour	-	-	-	1,760	-	-	1,760
Municipal Affairs	515	495	-	2,742	101	-	3,853
AOSTRA	42,020	-	20	-	-	-	42,040
Occupational Health and Safety	120	16	-	772	-	-	908
Recreation and Parks	-	-	-	137	-	-	137
Solicitor General	-	-	-	2,536	-	-	2,536
Special Waste Management Corporation	-	-	-	150	18	-	168
Technology, Research and Telecommunications	59,907	300	-	921	-	-	61,128
Tourism	-	-	-	1,528	235	-	1,763
Transportation and Utilities	1,754	55	268	7,457	13	374	9,921
Treasury	-	-	-	2,219	-	41	2,260
TOTAL	**172,795**	**4,318**	**781**	**90,706**	**939**	**1,233**	**270,772**

(1) Administration of extramural programs.

TABLE 19. Total Expenditures on R&D by Department or Agency and Performer, 1990-91 Estimates

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Advanced Education	4	-	-	72	-	100	176
Agriculture	7,500	241	1,800	-	-	3,800	13,341
Alcoholism and Drug Abuse Commission	91	-	-	-	-	-	91
Attorney General	-	-	303	-	-	-	303
Education	161	50	50	-	5	15	281
Energy	795	3,695	571	-	946	762	6,769
Environment	136	474	10	-	90	-	710
Environmental Centre	4,984	450	-	-	95	-	5,529
Family and Social Services	685	100	19	-	-	-	804
Forestry, Lands and Wildlife	2,658	859	179	-	800	153	4,649
Health	407	-	927	2,021	-	666	4,021
Alberta Heritage Foundation for Medical Research	1,760	500	31,390	-	-	2,100	35,750
Municipal Affairs	495	440	75	-	-	-	1,010
AOSTRA	3,700	29,653	3,202	-	4,360	1,125	42,040
Occupational Health and Safety	46	-	90	-	-	-	136
Recreation and Parks	-	-	-	-	-	-	-
Technology, Research and Telecommunications	300	27,436	7,531	370	24,570	-	60,207
Tourism	-	-	-	-	-	-	-
Transportation and Utilities	1,095	100	125	-	300	457	2,077
TOTAL	**24,817**	**63,998**	**46,272**	**2,463**	**31,166**	**9,178**	**177,894**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

Table 20. Departmental Personnel Engaged in Scientific Activities, 1990-91 Estimates

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	1	-	3
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	55	85	-	140	115	155	-	270
Alcoholism and Drug Abuse Commission	-	2	-	2	6	3	2	11
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	117	111	64	292
Economic Development and Trade	-	-	-	-	32	1	6	39
Education	1	-	-	1	7	2	2	11
Energy	-	-	-	-	2	-	-	2
Environment	2	-	-	2	19	32	3	54
Environmental Centre	25	43	20	88	35	61	31	127
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	12	-	-	12	4	1	-	5
Forestry, Lands and Wildlife	34	12	5	51	35	191	22	248
Health	4	3	3	10	29	5	15	49
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	19	1	8	28
Municipal Affairs	5	-	-	5	30	-	12	42
AOSTRA	29	-	20	49	-	-	-	-
Occupational Health and Safety	1	-	-	1	9	3	4	16
Recreation and Parks	-	-	-	-	2	2	-	4
Solicitor General	-	-	-	-	11	21	-	32
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	-	-	-	-	7	-	-	7
Tourism	-	-	-	-	10	1	3	14
Transportation and Utilities	5	1	1	7	33	73	40	146
Treasury	-	-	-	-	24	2	7	33
TOTAL	**173**	**146**	**49**	**368**	**586**	**670**	**233**	**1,489**

TABLE 20. Departmental Personnel Engaged in Scientific Activities, 1990-91 Estimates - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	1	-	3
Advanced Education	-	-	-	-	8	-	3	11
Agriculture	2	2	8	12	172	242	8	422
Alcoholism and Drug Abuse Commission	-	-	-	-	6	5	2	13
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	117	111	64	292
Economic Development and Trade	-	-	1	1	32	1	7	40
Education	3	1	1	5	11	3	3	17
Energy	7	-	5	12	9	-	5	14
Environment	3	-	1	4	24	32	4	60
Environmental Centre	2	-	1	3	62	104	52	218
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	-	-	-	-	16	1	-	17
Forestry, Lands and Wildlife	13	14	17	44	82	217	44	343
Health	1	-	-	1	34	8	18	60
Alberta Heritage Foundation for Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	19	1	8	28
Municipal Affairs	1	-	4	5	36	-	16	52
AOSTRA	-	-	-	-	29	-	20	49
Occupational Health and Safety	1	-	-	1	11	3	4	18
Recreation and Parks	-	-	-	-	2	2	-	4
Solicitor General	-	-	-	-	11	21	-	32
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	3	-	1	4	10	-	1	11
Tourism	5	-	1	6	15	1	4	20
Transportation and Utilities	-	-	1	1	38	74	42	154
Treasury	-	-	-	-	24	2	7	33
TOTAL	**45**	**17**	**52**	**114**	**804**	**833**	**334**	**1,971**

TABLE 21. Objectives of Expenditures by Department or Agency, 1990-91 Estimates

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	in thousands of dollars								
Access Network	-	-	-	-	-	-	-	-	-
Advanced Education	100	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-
Alcoholism and Drug Abuse Commission	-	-	-	-	-	-	-	-	-
Attorney General	-	-	-	-	-	-	-	-	-
Career Development and Employment	-	-	-	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-	-	-	-
Economic Development and Trade	-	-	-	-	-	-	-	-	-
Education	-	-	-	-	-	-	-	-	-
Energy	-	-	5,195	1,668	-	-	-	-	-
Environment	90	-	-	-	-	461	600	631	2,376
Environmental Centre	-	149	-	-	-	954	222	1,628	-
Environment Council	-	-	-	-	-	-	-	-	1,243
Family and Social Services	-	-	-	-	-	-	-	-	-
Forestry, Lands and Wildlife	10	-	-	-	-	-	72	-	2,677
Health	-	-	-	-	-	40	55	-	20
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	-	-	-	-
AOSTRA	7,562	-	34,478	-	-	-	-	-	-
Occupational Health and Safety	-	-	-	-	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-	-	12	-
Solicitor General	-	-	-	-	-	-	-	-	-
Special Waste Management Corporation	-	-	-	-	168	-	-	-	-
Technology, Research and Telecommunications	-	-	-	-	-	-	-	-	-
Tourism	-	-	-	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-	-	-
TOTAL	**7,762**	**149**	**39,673**	**1,668**	**168**	**1,455**	**949**	**2,271**	**6,316**

TABLE 21. Objectives of Expenditures by Department or Agency, 1990-91 Estimates - Continued

Department or agency	Health	Industrial and economic development				
		Agriculture	Fisheries	Forestry	Manufacturing	Other
	in thousands of dollars					
Access Network	-	-	-	25	-	-
Advanced Education	-	-	-	-	-	-
Agriculture	-	20,841	-	-	-	-
Alcoholism and Drug Abuse Commission	592	-	-	-	-	-
Attorney General	-	-	-	-	-	-
Career Development and Employment	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-
Economic Development and Trade	-	-	-	-	749	1,895
Education	-	-	-	-	-	-
Energy	-	-	-	-	-	-
Environment	-	-	-	-	-	-
Environmental Centre	3,890	2,788	149	149	-	-
Environment Council	-	-	-	-	-	-
Family and Social Services	-	-	-	-	-	-
Forestry, Lands and Wildlife	-	-	819	2,300	-	-
Health	7,052	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	36,076	-	-	-	-	-
Labour	-	-	-	-	-	639
Municipal Affairs	-	-	-	-	-	1,211
AOSTRA	-	-	-	-	-	-
Occupational Health and Safety	908	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-
Solicitor General	-	-	-	-	-	-
Special Waste Management Corporation	-	-	-	-	-	-
Technology, Research and Telecommunications	370	-	-	-	36,188	-
Tourism	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-
Treasury	-	-	-	-	-	-
TOTAL	**48,888**	**23,629**	**968**	**2,474**	**36,937**	**3,745**

TABLE 21. Objectives of Expenditures by Department or Agency, 1990-91 Estimates - Concluded

Department or agency	Social development					Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human resources	Urban and regional studies	Other				
	in thousands of dollars								
Access Network	-	135	-	-	-	-	-	-	160
Advanced Education	800	1,686	-	-	72	-	-	-	2,658
Agriculture	-	-	-	-	-	-	-	-	20,841
Alcoholism and Drug Abuse Commission	-	-	-	-	-	-	-	-	592
Attorney General	-	-	-	-	303	-	-	-	303
Career Development and Employment	-	-	1,670	-	-	-	-	-	1,670
Culture and Multiculturalism	22,299	-	-	-	-	-	-	-	22,299
Economic Development and Trade	-	-	-	-	-	520	-	-	3,164
Education	-	1,792	-	-	-	-	-	-	1,792
Energy	-	-	-	-	-	-	-	-	6,863
Environment	-	-	-	-	-	-	-	-	4,158
Environmental Centre	831	-	-	-	-	-	847	-	11,607
Environment Council	-	-	-	-	-	-	-	-	1,243
Family and Social Services	-	130	80	-	885	-	-	-	1,095
Forestry, Lands and Wildlife	-	-	-	-	-	-	1,960	14,755	22,593
Health	-	17	-	-	-	-	-	-	7,184
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	36,076
Labour	-	-	796	-	325	-	-	-	1,760
Municipal Affairs	-	-	-	2,642	-	-	-	-	3,853
AOSTRA	-	-	-	-	-	-	-	-	42,040
Occupational Health and Safety	-	-	-	-	-	-	-	-	908
Recreation and Parks	125	-	-	-	-	-	-	-	137
Solicitor General	-	-	-	-	2,536	-	-	-	2,536
Special Waste Management Corporation	-	-	-	-	-	-	-	-	168
Technology, Research and Telecommunications	-	-	-	-	-	-	-	24,570	61,128
Tourism	-	-	-	-	1,763	-	-	-	1,763
Transportation and Utilities	-	-	-	-	-	9,921	-	-	9,921
Treasury	-	-	-	-	2,260	-	-	-	2,260
TOTAL	**24,055**	**3,760**	**2,546**	**2,642**	**8,144**	**10,441**	**2,807**	**39,325**	**270,772**

TABLE 22. Objectives of Expenditures by Activity, 1990-91 Estimates

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	in thousands of dollars				
Advancement of science	-	-	7,762	-	7,762
Energy and fuels:					
Conservation	149	-	-	-	149
Fossil fuels	4,301	80	35,292	-	39,673
Renewable resources	194	14	1,460	-	1,668
Other	-	18	-	150	168
Environmental issues:					
Air	398	837	160	60	1,455
Land	180	142	509	118	949
Water	356	1,486	244	185	2,271
Other	1,628	3,126	376	1,186	6,316
Health	3,400	6,263	38,180	1,045	48,888
Industrial and economic development:					
Agriculture	8,647	8,541	5,841	600	23,629
Fisheries	269	199	-	500	968
Forestry	299	75	1,400	700	2,474
Manufacturing	300	954	34,967	716	36,937
Other	495	2,435	515	300	3,745
Social development:					
Culture, sport and recreation	649	17,382	-	6,024	24,055
Education	165	1,613	120	1,862	3,760
Human resources	-	2,026	-	520	2,546
Urban and regional studies	-	2,277	-	365	2,642
Other	685	4,204	494	2,761	8,144
Transportation	1,095	7,919	982	445	10,441
Wildlife	1,102	1,150	55	500	2,807
Other	505	11,300	24,720	2,800	39,325
TOTAL	**24,817**	**72,041**	**153,077**	**20,837**	**270,772**

Natural Sciences

TABLE 23. Total Expenditures in the Natural Sciences by Activity, 1982-83 to 1990-91(e)

Activity	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Research and development:									
Current expenditures:									
In-house	14,514	15,128	14,251	15,312	17,105	13,491	16,766	17,472	18,522
Contracts	51,563	46,107	84,544	55,733	86,724	41,096	27,476	23,981	38,205
Grants	61,661	79,695	82,533	103,084	140,493	107,096	93,204	98,815	112,789
Research fellowships	283	473	528	433	412	847	150	197	570
Administration of extramural R&D programs	...	...	...	...	...	7,102	8,440	4,430	4,250
Sub-total	128,021	141,403	181,856	174,562	244,734	169,632	146,036	144,895	174,336
Capital expenditures	8,020	11,409	2,396	1,171	653	491	423	917	745
Related scientific activities:									
Current expenditures:									
Education support	...	...	112	84	66	55	5,979	829	108
Technical surveys	...	...	26,713	26,550	26,739	22,921	24,290	30,512	30,477
Information services	...	...	5,526	6,042	8,028	7,282	13,517	10,732	9,016
Special services and studies	...	...	5,319	6,347	5,283	7,491	10,098	5,232	4,469
Museum services	...	...	892	953	1,911	3,414	3,202	3,444	3,415
Administration of extramural RSA programs	...	...	...	...	...	265	560	383	427
Sub-total	30,592	34,807	38,562	39,976	42,027	41,428	57,646	51,132	47,912
Capital expenditures	2,357	2,408	1,839	1,844	1,578	1,594	2,222	1,141	1,065
TOTAL	**168,990**	**190,027**	**224,653**	**217,553**	**288,992**	**213,145**	**206,327**	**198,085**	**224,058**

TABLE 24. Total Expenditures in the Natural Sciences by Department or Agency, 1982-83 to 1990-91(e)

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Agricultural Research Trust	373	369	414	391	410	467	...	...	...
Agriculture	16,391	19,532	19,272	19,787	17,153	17,626	20,776	20,688	20,841
Community and Occupational Health	...	...	...	...	120	562	...	...	...
Culture and Multiculturalism	578	798	892	953	2,625	3,414	3,193	3,486	3,415
Energy	...	...	...	...	7,917	6,248	4,527	8,713	6,863
Energy and Natural Resources	25,210	28,509	19,622	15,197	...	...	...		
Environment	9,179	12,877	15,221	16,233	15,935	14,498	6,549	4,001	4,158
Environmental Centre	10,528	11,605	11,330	12,286	11,712	11,076	11,126	11,032	11,607
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...	...
Forestry, Lands and Wildlife	...	...	...	...	8,760	6,715	22,092	21,471	22,593
Health	...	...	...	...	...	...	3,165	2,891	3,039
Alberta Heritage Foundation for Medical Research	21,588	27,562	32,748	43,878	56,930	51,167	37,623	30,812	36,076
Hospitals and Medical Care	16,865	19,793	17,725	21,121	22,080	2,071	...	...	...
Housing	...	467	885	1,085	...	...	...	...	...
Labour	548	483	476	510	558	518	719	738	1,009
Mental Health Research Fund(1)	193	409	418	522	407	320	...	...	...
Municipal Affairs	...	...	...	...	1,233	1,172	1,057	1,377	1,211
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	32,957	32,226	42,040
Occupational Health and Safety	...	...	...	...	...	...	175	1,122	422
Special Waste Management Corporation	...	...	...	...	...	...	...	160	168
Recreation and Parks	429	328	388	265	89	96	219	62	12
Technology, Research and Telecommunications	...	...	...	...	55,092	51,297	53,000	49,813	61,128
Transportation and Utilities	6,816	6,515	6,227	5,908	9,054	9,599	9,149	9,493	9,476
Workers' Health, Safety and Compensation	39	191	440	400	...	...	...	...	...
TOTAL	**168,990**	**190,027**	**224,653**	**217,553**	**288,992**	**213,145**	**206,327**	**198,085**	**224,058**

(1) Included with Department of Health as of 1988-89.

TABLE 25. Total Expenditures in the Natural Sciences by Performer, 1982-83 to 1990-91(e)

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Intramural	48,603	57,200	49,564	52,213	54,391	56,832	67,603	63,593	64,171
Industry	35,452	33,914	72,620	47,103	84,983	47,528	43,907	46,533	69,508
Universities	37,383	40,169	43,682	55,291	89,411	67,596	52,680	44,201	46,472
Hospitals and health organizations	11,080	16,498	15,206	18,454	18,479	607	1,423	2,802	2,331
Alberta Research Council(1)	32,349	35,038	38,597	39,143	33,748	33,032	31,411	31,433	31,161
Other	4,123	7,208	4,984	5,349	7,980	7,550	9,303	9,523	10,415
TOTAL	**168,990**	**190,027**	**224,653**	**217,553**	**288,992**	**213,145**	**206,327**	**198,085**	**224,058**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 26. Total Expenditures on R&D in the Natural Sciences by Performer, 1982-83 to 1990-91(e)

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Intramural	22,534	26,728	17,012	16,888	18,541	21,144	25,770	22,819	23,517
Industry	32,058	31,784	68,366	44,031	82,261	44,012	33,296	40,283	63,848
Universities	36,199	38,952	42,694	54,151	88,421	66,953	47,837	42,118	45,827
Hospitals and health organizations	11,080	16,433	15,130	18,444	18,479	607	1,383	2,802	2,331
Alberta Research Council(1)	31,179	33,365	37,292	38,107	31,021	31,893	29,938	30,060	31,161
Other	2,991	5,550	3,758	4,112	6,664	5,514	8,235	7,730	8,397
TOTAL	**136,041**	**152,812**	**184,252**	**175,733**	**245,387**	**170,123**	**146,459**	**145,812**	**175,081**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 27. Total Expenditures on R&D in the Natural Sciences by Department or Agency, 1982-83 to 1990-91(e)

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89[r]	1989-90[r]	1990-91(e)
	in thousands of dollars								
Agricultural Research Trust ..	373	369	414	391	410	467	...	...	...
Agriculture	13,699	15,782	11,937	12,471	10,153	9,820	13,315	13,482	13,341
Community and Occupational Health	...	...	...	...	75	552	...	...	...
Culture and Multiculturalism .	-	-	-	-	491	-	-	-	-
Energy	...	...	...	...	7,235	5,461	4,409	8,040	6,769
Energy and Natural Resources .	16,412	20,318	12,776	7,618	...	...	...	...	...
Environment	3,558	3,949	4,467	4,949	5,159	4,033	821	719	710
Environmental Centre	4,007	4,399	4,369	4,947	5,373	5,103	5,670	5,028	5,529
Executive Council	19,148	19,950	21,463	26,209	...	...	...	...	...
Forestry, Lands and Wildlife .	...	...	...	...	3,244	3,079	3,972	4,341	4,649
Health	...	...	...	...	...	...	2,576	2,800	2,922
Alberta Heritage Foundation for Medical Research	20,659	26,656	31,901	43,007	56,475	50,919	37,365	30,579	35,750
Hospitals and Medical Care ...	16,865	19,769	17,725	21,121	22,080	2,071	...	...	...
Housing	-	370	775	958	...	...	...	...	...
Mental Health Research Fund(1)	193	409	418	522	407	320	...	...	...
Municipal Affairs	-	-	-	-	1,088	1,025	641	1,178	1,010
AOSTRA	41,105	40,639	77,132	52,808	78,917	36,299	30,235	27,962	42,040
Occupational Health and Safety	...	...	...	...	...	...	175	794	77
Recreation and Parks	-	27	-	-	-	-	25	-	-
Technology, Research and Telecommunications	...	...	...	...	52,854	49,329	45,509	48,760	60,207
Transportation and Utilities .	13	66	762	642	1,426	1,645	1,746	2,129	2,077
Workers' Health, Safety and Compensation	9	109	113	90	...	...	...	...	...
TOTAL	**136,041**	**152,812**	**184,252**	**175,733**	**245,387**	**170,123**	**146,459**	**145,812**	**175,081**

(1) Included with Department of Health as of 1988-89.

TABLE 28 . Departmental Personnel Engaged in Scientific Activities in the Natural Sciences, by Activity and Category, 1982-83 to 1990-91(e)

Activity and category	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	(person-years)								
Research and development:									
Scientific and professional ..	150	159	154	171	180	132	131	149	157
Technical	130	137	147	144	154	162	149	144	142
Other	50	52	66	64	66	45	43	36	46
Sub-total	330	348	367	379	400	339	323	329	345
Related scientific activities:									
Scientific and professional ...	190	297	323	337	324	291	271	284	284
Technical	220	376	426	414	434	412	544	527	536
Other	84	75	76	81	125	118	117	118	106
Sub-total	494	748	825	832	883	821	932	929	926
Administration of extramural programs:									
Scientific and professional ...	...	...	...	...	...	59	46	37	36
Technical	...	...	...	...	...	6	16	16	16
Other	...	...	...	...	...	48	56	50	49
Sub-total	...	...	...	...	...	113	118	103	101
Total scientific activities:									
Scientific and professional ...	340	456	477	508	504	482	448	470	477
Technical	350	513	573	558	588	580	709	687	694
Other	134	127	142	145	191	211	216	204	201
TOTAL	**824**	**1,096**	**1,192**	**1,211**	**1,283**	**1,273**	**1,373**	**1,361**	**1,372**

TABLE 29. Total Expenditures in the Natural Sciences by Sources of Funds, 1989-90

Department or agency	Departmental budget	Other departments	Federal government	Trust funds	Other sources	Total
	in thousands of dollars					
Agriculture	15,688	-	-	5,000	-	20,688
Culture and Multiculturalism	3,486	-	-	-	-	3,486
Energy	8,713	-	-	-	-	8,713
Environment	3,521	-	-	480	-	4,001
Environmental Centre	10,800	-	-	34	198	11,032
Forestry, Lands and Wildlife	21,069	146	182	74	-	21,471
Health	182	-	-	2,709	-	2,891
Alberta Heritage Foundation for Medical Research	-	612	-	-	30,200	30,812
Labour	738	-	-	-	-	738
Municipal Affairs	1,377	-	-	-	-	1,377
AOSTRA	3,413	-	-	28,813	-	32,226
Occupational Health and Safety	176	-	-	769	177	1,122
Recreation and Parks	12	-	-	-	50	62
Special Waste Management Corporation	160	-	-	-	-	160
Technology, Research and Telecommunications	49,813	-	-	-	-	49,813
Transportation and Utilities	9,493	-	-	-	-	9,493
TOTAL	**128,641**	**758**	**182**	**37,879**	**30,625**	**198,085**

TABLE 30. Total Expenditures in the Natural Sciences by Activity and Performer, 1989-90

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Research and development:							
Current expenditures:							
In-house	17,472	...	...	...	...	...	17,472
Contracts	-	17,767	196	34	4,761	1,223	23,981
Grants	...	22,516	41,845	2,768	25,179	6,507	98,815
Research fellowships	-	-	77	-	120	-	197
Administration of extramural R&D programs	4,430	...	...	...	...	...	4,430
Sub-total	21,902	40,283	42,118	2,802	30,060	7,730	144,895
Capital expenditures	917	...	...	...	...	...	917
Related scientific activities:							
Current expenditures:							
Education support	50	30	530	-	-	211	829
Technical surveys	25,399	3,661	23	-	368	1,061	30,512
Information services	7,473	1,319	502	-	985	453	10,732
Special services and studies	2,884	1,240	1,020	-	20	68	5,232
Museum services	3,444	-	-	-	-	-	3,444
Administration of extramural RSA programs	383	...	...	...	...	...	383
Sub-total	39,633	6,250	2,083	-	1,373	1,793	51,132
Capital expenditures	1,141	...	...	...	...	...	1,141
TOTAL	**63,593**	**46,533**	**44,201**	**2,802**	**31,433**	**9,523**	**198,085**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 31. Total Expenditures in the Natural Sciences by Department or Agency and Performer, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Agriculture	14,044	867	1,914	-	-	3,863	20,688
Culture and Multiculturalism	3,486	-	-	-	-	-	3,486
Energy	1,019	5,802	484	-	1,189	219	8,713
Environment	2,118	641	30	-	244	968	4,001
Environmental Centre	10,534	364	44	-	90	-	11,032
Forestry, Lands and Wildlife	15,457	4,864	196	-	621	333	21,471
Health	111	-	912	1,868	-	-	2,891
Alberta Heritage Foundation for Medical Research	1,569	500	26,811	-	-	1,932	30,812
Labour	623	115	-	-	-	-	738
Municipal Affairs	727	575	75	-	-	-	1,377
AOSTRA	4,934	16,775	4,856	-	4,432	1,229	32,226
Occupational Health and Safety	390	63	105	564	-	-	1,122
Recreation and Parks	12	50	-	-	-	-	62
Special Waste Management Corporation	18	142	-	-	-	-	160
Technology, Research and Telecommunications	495	15,315	8,659	370	24,570	404	49,813
Transportation and Utilities	8,056	460	115	-	287	575	9,493
TOTAL	**63,593**	**46,533**	**44,201**	**2,802**	**31,433**	**9,523**	**198,085**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 32. Total Expenditures on R&D in the Natural Sciences by Department or Agency and Performer, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Agriculture	7,438	267	1,914	-	-	3,863	13,482
Energy	933	5,725	484	-	729	169	8,040
Environment	179	321	-	-	219	-	719
Environmental Centre	4,649	348	31	-	-	-	5,028
Forestry, Lands and Wildlife	2,274	1,074	159	-	621	213	4,341
Health	57	-	875	1,868	-	-	2,800
Alberta Heritage Foundation for Medical Research	1,564	500	26,605	-	-	1,910	30,579
Municipal Affairs	641	462	75	-	-	-	1,178
AOSTRA	3,640	16,275	3,413	-	3,634	1,000	27,962
Occupational Health and Safety	125	-	105	564	-	-	794
Technology, Research and Telecommunications	267	15,211	8,342	370	24,570	-	48,760
Transportation and Utilities	1,052	100	115	-	287	575	2,129
TOTAL	**22,819**	**40,283**	**42,118**	**2,802**	**30,060**	**7,730**	**145,812**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 33. Total Expenditures in the Natural Sciences by Department or Agency and Activity, 1989-90

Department or agency	Research and development			Related scientific activities							Total
	Current	AEP(1)	Capital	Education support	Technical surveys	Information services	Special services and studies	Museum Services	AEP(1)	Capital	
	in thousands of dollars										
Agriculture	12,946	536	-	-	900	5,059	1,247	-	-	-	20,688
Culture and Multiculturalism	-	-	-	-	-	-	-	3,444	-	42	3,486
Energy	7,107	923	10	-	273	232	168	-	-	-	8,713
Environment	640	79	-	30	2,289	161	787	-	-	15	4,001
Environmental Centre	4,618	99	311	-	5,623	-	16	-	-	365	11,032
Forestry, Lands and Wildlife	4,131	160	50	87	15,101	1,050	338	-	254	300	21,471
Health	2,790	10	-	37	-	25	14	-	5	10	2,891
Alberta Heritage Foundation for Medical Research	29,015	1,564	-	21	-	207	-	-	5	-	30,812
Labour	-	-	-	-	-	115	623	-	-	-	738
Municipal Affairs	537	420	221	-	-	103	10	-	86	-	1,377
AOSTRA	27,732	227	3	654	-	2,269	1,341	-	-	-	32,226
Occupational Health and Safety	694	100	-	-	-	-	328	-	-	-	1,122
Recreation and Parks	-	-	-	-	62	-	-	-	-	-	62
Special Waste Management Corporation	-	-	-	-	30	112	-	-	18	-	160
Technology, Research and Telecommunication	48,493	267	-	-	-	1,053	-	-	-	-	49,813
Transportation and Utilities	1,762	45	322	-	6,234	346	360	-	15	409	9,493
TOTAL	**140,465**	**4,430**	**917**	**829**	**30,512**	**10,732**	**5,232**	**3,444**	**383**	**1,141**	**198,085**

(1) Administration of extramural programs.

TABLE 34. Intramural Expenditures in the Natural Sciences by Department or Agency and Type of Expenditure, 1989-90

Department or agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	in thousands of dollars			
Agriculture	9,420	4,624	-	14,044
Culture and Multiculturalism	2,179	1,265	42	3,486
Energy	969	40	10	1,019
Environment	1,658	445	15	2,118
Environmental Centre	7,414	2,444	676	10,534
Forestry, Lands and Wildlife	12,182	2,925	350	15,457
Health	101	-	10	111
Alberta Heritage Foundation for Medical Research	566	1,003	-	1,569
Labour	623	-	-	623
Municipal Affairs	375	131	221	727
AOSTRA	2,480	2,451	3	4,934
Occupational Health and Safety	336	54	-	390
Recreation and Parks	12	-	-	12
Special Waste Management Corporation	15	3	-	18
Technology, Research and Telecommunications	293	202	-	495
Transportation and Utilities	5,637	1,688	731	8,056
TOTAL	**44,260**	**17,275**	**2,058**	**63,593**

TABLE 35. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1989-90

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	57	84	-	141	116	156	-	272
Culture and Multiculturalism	-	-	-	-	23	22	13	58
Energy	-	-	-	-	2	-	-	2
Environment	2	1	-	3	18	32	3	53
Environmental Centre	25	43	20	88	35	61	29	125
Forestry, Lands and Wildlife	34	14	3	51	33	182	28	243
Health	2	-	-	2	-	1	-	1
Alberta Heritage Foundation of Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	12	-	-	12
Municipal Affairs	4	-	-	4	-	-	-	-
AOSTRA	19	-	12	31	6	-	6	12
Occupational Health and Safety	1	-	-	1	3	2	2	7
Recreation and Parks	-	-	-	-	-	1	-	1
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	-	-	-	-	4	-	-	4
Transportation and Utilities	5	2	1	8	31	70	37	138
TOTAL	**149**	**144**	**36**	**329**	**284**	**527**	**118**	**929**

TABLE 35. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1989-90 - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	2	2	8	12	175	242	8	425
Culture and Multiculturalism	-	-	-	-	23	22	13	58
Energy	7	-	5	12	9	-	5	14
Environment	3	-	1	4	23	33	4	60
Environmental Centre	2	-	1	3	62	104	50	216
Forestry, Lands and Wildlife	12	14	18	44	79	210	49	338
Health	-	-	-	-	2	1	-	3
Alberta Heritage Foundation for Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	12	-	-	12
Municipal Affairs	1	-	4	5	5	-	4	9
AOSTRA	1	-	1	2	26	-	19	45
Occupational Health and Safety	2	-	-	2	6	2	2	10
Recreation and Parks	-	-	-	-	-	1	-	1
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	2	-	-	2	6	-	-	6
Transportation and Utilities	1	0	1	2	37	72	39	148
TOTAL	**37**	**16**	**50**	**103**	**470**	**687**	**204**	**1,361**

TABLE 36. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1989-90

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	in thousands of dollars								
Agriculture	-	-	-	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-	-	-	-
Energy	-	339	7,758	616	-	-	-	-	-
Environment	90	-	-	-	-	413	874	405	2,219
Environmental Centre	-	139	-	-	-	875	3,021	1,730	16
Forestry, Lands and Wildlife	1	-	-	-	-	-	18	-	2,417
Health	-	-	-	-	-	6	-	-	-
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	-	-	-	-
AOSTRA	8,154	-	24,072	-	-	-	-	-	-
Occupational Health and Safety	-	-	-	-	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-	-	12	-
Special Waste Management Corporation	-	-	-	-	160	-	-	-	-
Technology, Research and Telecommunications	-	-	-	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-	-	-	-
TOTAL	**8,245**	**478**	**31,830**	**616**	**160**	**1,294**	**3,913**	**2,147**	**4,652**

TABLE 36. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1989-90 - Continued

Department or agency	Health	Industrial and economic development				
		Agriculture	Fisheries	Forestry	Manufacturing	Other
	in thousands of dollars					
Agriculture	-	20,688	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-
Energy	-	-	-	-	-	-
Environment	-	-	-	-	-	-
Environmental Centre	3,678	-	-	-	-	-
Forestry, Lands and Wildlife	-	-	316	1,959	-	-
Health	2,848	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	30,812	-	-	-	-	-
Labour	-	-	-	-	-	623
Municipal Affairs	-	-	-	-	-	1,377
AOSTRA	-	-	-	-	-	-
Occupational Health and Safety	1,122	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-
Special Waste Management Corporation	-	-	-	-	-	-
Technology, Research and Telecommunications	370	-	-	-	24,873	-
Transportation and Utilities	-	-	-	-	-	-
TOTAL	**38,830**	**20,688**	**316**	**1,959**	**24,873**	**2,000**

TABLE 36. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1989-90 - Concluded

Department or agency	Social Development				Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human resources	Other				
	in thousands of dollars							
Agriculture	-	-	-	-	-	-	-	20,688
Culture and Multiculturalism	3,486	-	-	-	-	-	-	3,486
Energy	-	-	-	-	-	-	-	8,713
Environment	-	-	-	-	-	-	-	4,001
Environmental Centre	783	-	-	-	-	790	-	11,032
Forestry, Lands and Wildlife	-	-	-	-	-	2,005	14,755	21,471
Health	-	37	-	-	-	-	-	2,891
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	30,812
Labour	-	-	64	51	-	-	-	738
Municipal Affairs	-	-	-	-	-	-	-	1,377
AOSTRA	-	-	-	-	-	-	-	32,226
Occupational Health and Safety	-	-	-	-	-	-	-	1,122
Recreation and Parks	-	-	-	-	-	-	50	62
Special Waste Management Corp	-	-	-	-	-	-	-	160
Technology, Research and Telecommunications	-	-	-	-	-	-	24,570	49,813
Transportation and Utilities	-	-	-	-	9,493	-	-	9,493
TOTAL	**4,269**	**37**	**64**	**51**	**9,493**	**2,795**	**39,375**	**198,085**

TABLE 37. Objectives of Expenditures in the Natural Sciences by Activity, 1989-90

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	in thousands of dollars				
Advancement of science	-	-	8,245	-	8,245
Energy and fuels:					
Conservation	280	13	185	-	478
Fossil fuels	4,432	1,367	22,474	3,557	31,830
Renewable resources	-	-	616	-	616
Other	-	18	-	142	160
Environmental issues:					
Air	372	765	95	62	1,294
Land	1,385	1,717	450	361	3,913
Water	513	1,371	163	100	2,147
Other	1,257	1,795	374	1,226	4,652
Health	2,769	2,852	32,918	291	38,830
Industrial and economic development:					
Agriculture	7,438	6,606	6,044	600	20,688
Fisheries	106	167	-	43	316
Forestry	150	50	1,343	416	1,959
Manufacturing	267	228	23,553	825	24,873
Other	641	709	537	113	2,000
Social development:					
Culture, sport and recreation	606	3,663	-	-	4,269
Education	-	-	-	37	37
Human resources	-	-	-	64	64
Other	-	-	-	51	51
Transportation	1,052	7,004	1,077	360	9,493
Wildlife	1,045	1,150	100	500	2,795
Other	506	11,299	24,819	2,751	39,375
TOTAL	**22,819**	**40,774**	**122,993**	**11,499**	**198,085**

TABLE 38. Total Expenditures in the Natural Sciences by Activity and Performer, 1990-91 Estimates

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Research and development:							
Current expenditures:							
In-house	18,522	...	...	...	...	...	18,522
Contracts	-	31,060	180	65	5,645	1,255	38,205
Grants	...	32,788	45,197	2,266	25,396	7,142	112,789
Research fellowships	-	-	450	-	120	-	570
Administration of extramural R&D programs	4,250	...	...	...	...	...	4,250
Sub-total	22,772	63,848	45,827	2,331	31,161	8,397	174,336
Capital expenditures	745	...	...	...	...	...	745
Related scientific activities:							
Current expenditures:							
Education support	50	-	58	-	-	-	108
Technical surveys	25,919	3,570	-	-	-	988	30,477
Information services	7,024	1,375	587	-	-	30	9,016
Special services and studies	2,754	715	-	-	-	1,000	4,469
Museum services	3,415	-	-	-	-	-	3,415
Administrataion of extramural RSA programs	427	...	...	...	...	...	427
Sub-total	39,589	5,660	645	-	-	2,018	47,912
Capital expenditures	1,065	...	...	...	...	...	1,065
TOTAL	**64,171**	**69,508**	**46,472**	**2,331**	**31,161**	**10,415**	**224,058**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 39. Total Expenditures in the Natural Sciences by Department or Agency and Performer, 1990-91 Estimates

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Agriculture	14,400	841	1,800	-	-	3,800	20,841
Culture and Multiculturalism	3,415	-	-	-	-	-	3,415
Energy	889	3,695	571	-	946	762	6,863
Environment	2,305	745	30	-	90	988	4,158
Environmental Centre	11,062	450	-	-	95	-	11,607
Forestry, Lands and Wildlife	15,832	4,629	179	-	800	1,153	22,593
Health	157	-	921	1,961	-	-	3,039
Alberta Heritage Foundation for Medical Research	1,765	500	31,681	-	-	2,130	36,076
Labour	639	370	-	-	-	-	1,009
Municipal Affairs	596	540	75	-	-	-	1,211
AOSTRA	3,700	29,653	3,202	-	4,360	1,125	42,040
Occupational Health and Safety	312	70	40	-	-	-	422
Recreation and Parks	12	-	-	-	-	-	12
Special Waste Management Corp	18	150	-	-	-	-	168
Technology, Research and Telecommunications	800	27,540	7,848	370	24,570	-	61,128
Transportation and Utilities	8,269	325	125	-	300	457	9,476
TOTAL	**64,171**	**69,508**	**46,472**	**2,331**	**31,161**	**10,415**	**224,058**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 40. Total Expenditures in the Natural Sciences by Department or Agency and Activity, 1990-91 Estimates

Department or agency	Research and development			Related scientific activities							Total
	Current	AEP(1)	Capital	Education support	Technical surveys	Information services	Special services and studies	Museum services	AEP(1)	Capital	
	in thousands of dollars										
Agriculture	12,841	500	-	-	900	5,600	1,000	-	-	-	20,841
Culture and Multiculturalism	-	-	-	-	-	-	-	3,415	-	-	3,415
Energy	5,974	778	17	-	-	49	45	-	-	-	6,863
Environment	630	80	-	20	2,330	101	921	-	-	76	4,158
Environmental Centre	5,159	105	265	-	5,768	-	-	-	-	310	11,607
Forestry, Lands and Wildlife	4,314	160	175	50	15,005	1,050	1,259	-	280	300	22,593
Health	2,912	10	-	17	-	35	25	-	10	30	3,039
Alberta Heritage Foundation for Medical Research	33,990	1,760	-	21	-	300	-	-	3	-	36,076
Labour	-	-	-	-	-	370	639	-	-	-	1,009
Municipal Affairs	515	495	-	-	-	90	10	-	101	-	1,211
AOSTRA	42,020	-	20	-	-	-	-	-	-	-	42,040
Occupational Health and Safety	70	7	-	-	-	-	345	-	-	-	422
Recreation and Parks	-	-	-	-	12	-	-	-	-	-	12
Special Waste Management Corporation	-	-	-	-	-	150	-	-	18	-	168
Technology, Research and Telecommunications	59,907	300	-	-	-	921	-	-	-	-	61,128
Transportation and Utilities	1,754	55	268	-	6,462	350	225	-	13	349	9,476
TOTAL	**170,086**	**4,250**	**745**	**108**	**30,477**	**9,016**	**4,469**	**3,415**	**427**	**1,065**	**224,058**

(1) Administration of extramural programs.

TABLE 41. Total Expenditures on R&D in the Natural Sciences by Department or Agency and Performer, 1990-91 Estimates

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Agriculture	7,500	241	1,800	-	-	3,800	13,341
Energy	795	3,695	571	-	946	762	6,769
Environment	136	474	10	-	90	-	710
Environmental Centre	4,984	450	-	-	95	-	5,529
Forestry, Lands and Wildlife	2,658	859	179	-	800	153	4,649
Health	57	-	904	1,961	-	-	2,922
Alberta Heritage Foundation for Medical Research	1,760	500	31,390	-	-	2,100	35,750
Municipal Affairs	495	440	75	-	-	-	1,010
AOSTRA	3,700	29,653	3,202	-	4,360	1,125	42,040
Occupational Health and Safety	37	-	40	-	-	-	77
Technology, Research and Telecommunications	300	27,436	7,531	370	24,570	-	60,207
Transportation and Utilities	1,095	100	125	-	300	457	2,077
TOTAL	**23,517**	**63,848**	**45,827**	**2,331**	**31,161**	**8,397**	**175,081**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 42. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1990-91 Estimates

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	55	85	-	140	115	155	-	270
Culture and Multiculturalism	-	-	-	-	23	22	13	58
Energy	-	-	-	-	2	-	-	2
Environment	2	-	-	2	19	32	3	54
Environmental Centre	25	43	20	88	35	61	31	127
Forestry, Lands and Wildlife	34	12	5	51	35	191	22	248
Health	1	1	-	2	1	-	-	1
Alberta Heritage Foundation Medical Research	-	-	-	-	-	-	-	-
Labour	-	-	-	-	12	-	-	12
Municipal Affairs	5	-	-	5	-	-	-	-
AOSTRA	29	-	20	49	-	-	-	-
Occupational Health and Safety	1	-	-	1	3	2	2	7
Recreation and Parks	-	-	-	-	-	1	-	1
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	-	-	-	-	7	-	-	7
Transportation and Utilities	5	1	1	7	31	72	35	138
TOTAL	**157**	**142**	**46**	**345**	**284**	**536**	**106**	**926**

TABLE 42. Departmental Personnel Engaged in Scientific Activities in the Natural Sciences by Department or Agency, 1990-91 Estimates - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Agriculture	2	2	8	12	172	242	8	422
Culture and Multiculturalism	-	-	-	-	23	22	13	58
Energy	7	-	5	12	9	-	5	14
Environment	3	-	1	4	24	32	4	60
Environmental Centre	2	-	1	3	62	104	52	218
Forestry, Lands and Wildlife	13	14	17	44	82	217	44	343
Health	-	-	-	-	2	1	-	3
Alberta Heritage Foundation Medical Research	4	-	11	15	4	-	11	15
Labour	-	-	-	-	12	-	-	12
Municipal Affairs	1	-	4	5	6	-	4	10
AOSTRA	-	-	-	-	29	-	20	49
Occupational Health and Safety	1	-	-	1	5	2	2	9
Recreation and Parks	-	-	-	-	-	1	-	1
Special Waste Management Corporation	-	-	-	-	1	-	-	1
Technology, Research and Telecommunications	3	-	1	4	10	-	1	11
Transportation and Utilities	-	-	1	1	36	73	37	146
TOTAL	**36**	**16**	**49**	**101**	**477**	**694**	**201**	**1,372**

TABLE 43. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1990-91 Estimates

Department or agency	Advancement of science	Energy and fuels				Environmental issues			
		Conservation	Fossil fuels	Renewable resources	Other	Air	Land	Water	Other
	in thousands of dollars								
Agriculture	-	-	-	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-	-	-	-
Energy	-	-	5,195	1,668	-	-	-	-	-
Environment	90	-	-	-	-	461	600	631	2,376
Environmental Centre	-	149	-	-	-	954	222	1,628	-
Forestry, Lands and Wildlife	10	-	-	-	-	-	72	-	2,677
Health	-	-	-	-	-	40	55	-	20
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	-	-	-	-
AOSTRA	7,562	-	34,478	-	-	-	-	-	-
Occupational Health and Safety	-	-	-	-	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-	-	12	-
Special Waste Management Corporation	-	-	-	-	168	-	-	-	-
Technology, Research and Telecommunications	-	-	-	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-	-	-	-
TOTAL	**7,662**	**149**	**39,673**	**1,668**	**168**	**1,455**	**949**	**2,271**	**5,073**

TABLE 43. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1990-91 Estimates - Continued

Department or agency	Health	Industrial and economic development				
		Agriculture	Fisheries	Forestry	Manufacturing	Other
	in thousands of dollars					
Agriculture	-	20,841	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-
Energy	-	-	-	-	-	-
Environment	-	-	-	-	-	-
Environmental Centre	3,890	2,788	149	149	-	-
Forestry, Lands and Wildlife	-	-	819	2,300	-	-
Health	2,907	-	-	-	-	-
Alberta Heritage Foundation for Medical Research	36,076	-	-	-	-	-
Labour	-	-	-	-	-	639
Municipal Affairs	-	-	-	-	-	1,211
AOSTRA	-	-	-	-	-	-
Occupational Health and Safety	422	-	-	-	-	-
Recreation and Parks	-	-	-	-	-	-
Special Waste Management Corporation	-	-	-	-	-	-
Technology, Research and Telecommunications	370	-	-	-	36,188	-
Transportation and Utilities	-	-	-	-	-	-
TOTAL	**43,665**	**23,629**	**968**	**2,449**	**36,188**	**1,850**

TABLE 43. Objectives of Expenditures in the Natural Sciences by Department or Agency, 1990-91 Estimates - Concluded

Department or agency	Social Development				Transportation	Wildlife	Other	Total
	Culture, sport and recreation	Education	Human resources	Other				
	in thousands of dollars							
Agriculture	-	-	-	-	-	-	-	20,841
Culture and Multiculturalism	3,415	-	-	-	-	-	-	3,415
Energy	-	-	-	-	-	-	-	6,863
Environment	-	-	-	-	-	-	-	4,158
Environmental Centre	831	-	-	-	-	847	-	11,607
Forestry, Lands and Wildlife	-	-	-	-	-	1,960	14,755	22,593
Health	-	17	-	-	-	-	-	3,039
Alberta Heritage Foundation for Medical Research	-	-	-	-	-	-	-	36,076
Labour	-	-	45	325	-	-	-	1,009
Municipal Affairs	-	-	-	-	-	-	-	1,211
AOSTRA	-	-	-	-	-	-	-	42,040
Occupational Health and Safety	-	-	-	-	-	-	-	422
Recreation and Parks	-	-	-	-	-	-	-	12
Special Waste Management Corporation	-	-	-	-	-	-	-	168
Technology, Research and Telecommunications	-	-	-	-	-	-	24,570	61,128
Transportation and Utilities	-	-	-	-	9,476	-	-	9,476
TOTAL	**4,246**	**17**	**45**	**325**	**9,476**	**2,807**	**39,325**	**224,058**

TABLE 44. Objectives of Expenditures in the Natural Sciences by Activity, 1990-91 Estimates

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	in thousands of dollars				
Advancement of science	-	-	7,662	-	7,662
Energy and fuels:					
Conservation	149	-	-	-	149
Fossil fuels	4,301	-	35,292	-	39,593
Renewable resources	194	-	1,460	-	1,654
Other	-	112	-	150	262
Environmental issues:					
Air	398	837	160	60	1,455
Land	180	142	509	118	949
Water	356	1,486	244	185	2,271
Other	2,475	1,883	376	1,186	5,920
Health	2,950	2,943	37,381	391	43,665
Industrial and economic development:					
Agriculture	8,647	8,541	5,841	600	23,629
Fisheries	269	199	-	500	968
Forestry	299	50	1,400	700	2,449
Manufacturing	300	500	34,967	421	36,188
Other	495	740	515	100	1,850
Social development and related areas:					
Culture, sport and recreation	649	3,597	-	-	4,246
Education	-	-	-	17	17
Human resources	-	-	-	45	45
Other	-	-	-	325	325
Transportation	1,095	7,174	982	225	9,476
Wildlife	255	1,150	55	500	1,960
Other	505	11,300	24,720	2,800	39,325
TOTAL	**23,517**	**40,654**	**151,564**	**8,323**	**224,058**

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TABLE 45. Total Expenditures in the Social Sciences and Humanities, by Activity 1982-83 to 1990-91(e)

Activity	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Research and development:									
Current expenditures:									
In-house	237	657	1,263	1,265	3,727	363	966	900	1,196
Contracts	406	551	436	619	1,375	502	1,799	226	322
Grants	1,038	1,228	1,042	1,727	1,367	1,217	808	971	1,191
Research fellowships	23	30	5	20	21	111	-	217	-
Administration of extramural R&D programs	...	...	...	...	...	349	81	69	68
Sub-total	1,704	2,466	2,746	3,631	6,490	2,542	3,654	2,383	2,777
Capital expenditures	10	2	2	3	45	31	4	46	36
Related scientific activities:									
Current expenditures	38,546	40,732	39,579	46,460	35,960	37,981	38,181	44,808	43,221
Administration of extramural RSA programs	...	...	...	...	...	298	377	405	512
Sub-total	38,546	40,732	39,579	46,460	35,960	38,279	38,558	45,213	43,733
Capital expenditures	3,578	5,641	9,734	4,731	1,940	176	115	1,535	168
TOTAL	**43,838**	**48,841**	**52,061**	**54,825**	**44,435**	**41,028**	**42,331**	**49,177**	**46,714**

TABLE 46. Total Expenditures in the Social Sciences and Humanities by Department or Agency, 1982-83 to 1990-91(e)

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Access Network	200[e]	398	350	350	350	385	367	205	160
Advanced Education	...	1,354	1,639	2,150	1,783	1,561	2,176	2,647	2,658
Advanced Education and Manpower	2,612	...	...	...	...	...	...		
Alcoholism and Drug Abuse Commission	264	320	308	524	584	396	577	759	592
Attorney General	290	436	407	363	363	326	300	300	303
Career Development and Employment	...	...	...	...	1,863	1,716	1,588	1,654	1,670
Community and Occupational Health	...	...	...	...	866	948	...	...	...
Consumer and Corporate Affairs	143	172	157	154	174	191	98	...	...
Culture and Multiculturalism	16,480	21,515	25,736	20,736	16,973	15,281	15,820	19,332	18,884
Economic Development	4,093	3,374	3,180	4,418	...	...	...	...	...
Economic Development and Trade	...	...	...	...	5,740	5,391	3,478	3,212	3,164
Education	3,617[e]	2,724	3,019	3,068	2,507	1,728	2,139	2,114	1,792
Environment	508	232	123	515	549	92	7	43	-
Environment Council	1,243	1,525	1,176	1,060	1,245	1,016	939	1,043	1,243
Family and Social Services	...	...	...	...	421	579	629	814	1,095
Health	...	...	...	...	...	...	2,623	4,056	4,145
Hospitals and Medical Care	2,637	2,460	2,480	2,500	2,610	2,619	...	...	...
Housing	805	739	850	1,316	...	...	...		
Labour	557	564	591	729	684	614	620	875	751
Manpower	...	1,539	1,412	1,999	...	...	...	...	...
Mental Health Research Fund(1)	193	345	311	351	293	304	...	...	...
Municipal Affairs	1,408	1,577	1,037	870	2,311	2,411	2,865	2,663	2,642
Occupational Health and Safety	...	...	...	...	...	...	392	477	486
Recreation and Parks	511	207	494	250	342	392	825	215	125
Social Services and Community Health	400	463	507	5,481	...	...	...		
Solicitor General	3,478	4,434	4,521	2,234	1,617	1,892	2,526	5,040	2,536
Tourism	...	...	...	...	637	759	1,920	1,296	1,763
Tourism and Small Business	1,597	1,058	713	882	...	...	...	...	...
Transportation and Utilities	-	377	233	1,571	256	418	510	460	445
Treasury	1,994	2,097	2,094	2,172	2,267	2,009	1,932	1,972	2,260
Workers' Health, Safety and Compensation	808	931	723	1,132	...	...	...	...	...
TOTAL	**43,838**	**48,841**	**52,061**	**54,825**	**44,435**	**41,028**	**42,331**	**49,177**	**46,714**

(1) Included with Department of Health as of 1988-89.

TABLE 47. Total Expenditures in the Social Sciences and Humanities by Performer, 1982-83 to 1990-91(e)

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Intramural	31,396	36,057	42,542	37,096	33,150	30,576	28,256	33,609	32,687
Industry	9,050	8,709	5,636	10,540	6,323	3,160	4,979	5,977	4,584
Universities	1,859	1,658	2,094	3,533	1,772	1,939	2,094	2,096	2,498
Hospitals and health organizations	111	213	114	381	231	123	-	111	152
Alberta Research Council(1)	5	5	5	86	17	53	5	48	32
Other	1,417	2,199	1,670	3,189	2,942	5,177	6,997	7,336	6,761
TOTAL	**43,838**	**48,841**	**52,061**	**54,825**	**44,435**	**41,028**	**42,331**	**49,177**	**46,714**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 48. Total Expenditures on R&D in the Social Sciences and Humanities by Performer, 1982-83 to 1990-91(e)

Performer	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
Intramural	300	683	1,265	1,268	3,772	853	1,173	1,015	1,300
Industry	521	423	331	411	611	75	1,485	104	150
Universities	643	1,023	814	1,300	1,042	1,297	476	629	445
Hospitals and health organizations	111	213	114	381	231	123	-	-	132
Alberta Research Council(1)	5	5	5	20	-	48	5	48	5
Other	134	121	219	254	839	177	519	633	781
TOTAL	**1,714**	**2,468**	**2,748**	**3,634**	**6,535**	**2,573**	**3,658**	**2,429**	**2,813**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 49. Total Expenditures on R&D in the Social Sciences and Humanities by Department or Agency, 1982-83 to 1990-91(e)

Department or agency	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89[r]	1989-90	1990-91(e)
	in thousands of dollars								
ACCESS Network	7[•]	-	31	31	31	-	-	-	-
Advanced Education	-	19	65	488	462	472	238	176	176
Alcoholism and Drug Abuse Commission	7	1	1	-	-	-	-	67	91
Attorney General	290	436	407	363	363	326	300	300	303
Career Development and Employment	...	...	...	...	-	-	19	-	-
Community and Occupational Health	...	...	...	...	159	266	...	...	...
Culture and Multiculturalism	296	773	1,464	1,464	3,720	-	1,359	-	-
Education	295[•]	302	324	526	1,376	753	471	363	281
Environment	-	-	-	-	-	-	-	43	-
Family and Social Services	...	...	...	...	20	190	367	474	804
Health	...	...	...	...	...	...	518	1,006	1,099
Hospitals and Medical Care	111	111	111	111	111	214	...	...	...
Housing	385	-	-	-	...	...	...	...	...
Manpower	...	90	-	-	...	...	...	...	...
Mental Health Research Fund(1)	193	345	317	351	293	304	...	...	...
Municipal Affairs and Housing	68	53	-	-	...	...	...	-	-
Occupational Health and Safety	...	...	...	...	...	...	-	-	59
Tourism	...	...	...	...	-	48	1,745	-	-
Treasury	-	-	-	-	-	-	-	-	-
Workers' Health, Safety and Compensation	62	338	34	300	...	...	...	...	...
TOTAL	**1,714**	**2,468**	**2,748**	**3,634**	**6,535**	**2,573**	**3,658**	**2,429**	**2,813**

(1) Included with Department of Health as of 1988-89.

TABLE 50. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities, by Activity and Category, 1982-83 to 1990-91(e)

Activity and category	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88[r]	1988-89[r]	1989-90	1990-91(e)
	(persons years)								
Research and development:									
Scientific and professional	24	16	36	36	44	4	19	11	16
Technical	2	-	1	1	5	-	3	3	4
Other	3	5	2	2	4	-	4	4	3
Sub-total	29	21	39	39	53	4	26	18	23
Related scientific activities:									
Scientific and professional	261	298	405	384	306	315	299	315	302
Technical	66	56	198	175	95	155	148	141	134
Other	103	131	188	168	107	109	115	130	127
Sub-total	430	485	791	727	508	579	562	586	563
Administration of extramural programs:									
Scientific and professional	...	...	...	...	...	8	7	9	9
Technical	...	...	...	...	...	-	1	1	1
Other	...	...	...	...	...	8	2	3	3
Sub-total	...	...	...	...	...	16	10	13	13
Total scientific activities:									
Scientific and professional	285	314	441	420	350	327	325	335	327
Technical	68	56	199	176	100	155	152	145	139
Other	106	136	190	170	111	117	121	137	133
TOTAL	**459**	**506**	**830**	**766**	**561**	**599**	**598**	**617**	**599**

TABLE 51. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Sources of Funds, 1989-90

Department or agency	Departmental budget	Other departments	Federal government	Trust funds	Other sources	Total
	in thousands of dollars					
Access Network	136	11	41	17	-	205
Advanced Education	2,647	-	-	-	-	2,647
Alcoholism and Drug Abuse Commission	692	-	67	-	-	759
Attorney General	300	-	-	-	-	300
Career Development and Employment	1,654	-	-	-	-	1,654
Culture and Multiculturalism	19,332	-	-	-	-	19,332
Economic Development and Trade	3,212	-	-	-	-	3,212
Education	2,114	-	-	-	-	2,114
Environment	43	-	-	-	-	43
Environment Council	1,043	-	-	-	-	1,043
Family and Social Services	814	-	-	-	-	814
Health	4,019	-	37	-	-	4,056
Labour	875	-	-	-	-	875
Municipal Affairs	2,663	-	-	-	-	2,663
Occupational Health and Safety	239	-	-	-	238	477
Recreation and Parks	215	-	-	-	-	215
Solicitor General	5,020	-	-	-	20	5,040
Tourism	1,296	-	-	-	-	1,296
Transportation and Utilities	460	-	-	-	-	460
Treasury	1,972	-	-	-	-	1,972
TOTAL	**48,746**	**11**	**145**	**17**	**258**	**49,177**

TABLE 52. Total Expenditures in the Social Sciences and Humanities by Activity and Performer, 1989-90

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Research and development:							
Current expenditures:							
In-house	900	...	...	...	...	...	900
Contracts	-	104	40	-	-	82	226
Grants	...	-	372	-	48	551	971
Research fellowships	-	-	217	-	-	-	217
Administration of extramural R&D programs	69	...	...	...	...	...	69
Sub-total	969	104	629	-	48	633	2,383
Capital expenditures	46	...	...	...	...	...	46
Related scientific activities:							
Current expenditures	30,654	5,873	1,467	111	-	6,703	44,808
Administration of extramural RSA programs	405	...	...	...	...	...	405
Sub-total	31,059	5,873	1,467	111	-	6,703	45,213
Capital expenditures	1,535	...	...	...	...	...	1,535
TOTAL	**33,609**	**5,977**	**2,096**	**111**	**48**	**7,336**	**49,177**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 53. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Performer, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Access Network	205	-	-	-	-	-	205
Advanced Education	486	-	1,261	-	-	900	2,647
Alcoholism and Drug Abuse Commission	759	-	-	-	-	-	759
Attorney General	-	-	300	-	-	-	300
Career Development and Employment	1,237	213	7	-	-	197	1,654
Culture and Multiculturalism	14,166	-	-	-	-	5,166	19,332
Economic Development and Trade	2,706	494	5	-	-	7	3,212
Education	1,418	104	260	-	5	327	2,114
Environment	-	-	-	-	43	-	43
Environment Council	1,043	-	-	-	-	-	1,043
Family and Social Services	572	104	20	-	-	118	814
Health	2,736	504	243	91	-	482	4,056
Labour	875	-	-	-	-	-	875
Municipal Affairs	2,599	-	-	-	-	64	2,663
Occupational Health and Safety	365	92	-	20	-	-	477
Recreation and Parks	215	-	-	-	-	-	215
Solicitor General	1,550	3,490	-	-	-	-	5,040
Tourism	591	630	-	-	-	75	1,296
Transportation and Utilities	460	-	-	-	-	-	460
Treasury	1,626	346	-	-	-	-	1,972
TOTAL	**33,609**	**5,977**	**2,096**	**111**	**48**	**7,336**	**49,177**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 54. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Activity, 1989-90

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP(1)	Capital	Current	AEP(1)	Capital	
	in thousands of dollars						
Access Network	-	-	-	188	-	17	205
Advanced Education	172	4	-	2,467	4	-	2,647
Alcoholism and Drug Abuse Commission	67	-	-	692	-	-	759
Attorney General	300	-	-	-	-	-	300
Career Development and Employment	-	-	-	1,654	-	-	1,654
Culture and Multiculturalism	-	-	-	18,003	-	1,329	19,332
Economic Development and Trade	-	-	-	3,140	26	46	3,212
Education	312	50	1	1,546	200	5	2,114
Environment	43	-	-	-	-	-	43
Environment Council	-	-	-	1,043	-	-	1,043
Family and Social Services	439	-	35	340	-	-	814
Health	981	15	10	2,951	40	59	4,056
Labour	-	-	-	875	-	-	875
Municipal Affairs	-	-	-	2,663	-	-	2,663
Occupational Health and Safety	-	-	-	477	-	-	477
Recreation and Parks	-	-	-	215	-	-	215
Solicitor General	-	-	-	5,040	-	-	5,040
Tourism	-	-	-	1,161	135	-	1,296
Transportation and Utilities	-	-	-	460	-	-	460
Treasury	-	-	-	1,893	-	79	1,972
TOTAL	**2,314**	**69**	**46**	**44,808**	**405**	**1,535**	**49,177**

(1) Administration of extramural programs.

TABLE 55. Total Expenditures on R&D in the Social Sciences and Humanities by Department or Agency and Performer, 1989-90

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Advanced Education	4	-	72	-	-	100	176
Alcoholism and Drug Abuse Commission	67	-		-	-	-	67
Attorney General	-	-	300	-	-	-	300
Education	251	-	25	-	5	82	363
Environment	-	-	-	-	43	-	43
Family and Social Services	355	104	15	-	-	-	474
Health	338	-	217	-	-	451	1,006
TOTAL	**1,015**	**104**	**629**	**-**	**48**	**633**	**2,429**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 56. Intramural Expenditures in the Social Sciences and Humanities by Department or Agency and Type of Expenditure, 1989-90

Department or agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	in thousands of dollars			
Access Network	80	108	17	205
Advanced Education	478	8	-	486
Alcoholism and Drug Abuse Commission	458	301	-	759
Career Development and Employment	1,117	120	-	1,237
Culture and Multiculturalism	8,716	4,121	1,329	14,166
Economic Development and Trade	2,000	660	46	2,706
Education	1,240	172	6	1,418
Environment Council	791	252	-	1,043
Family and Social Services	504	33	35	572
Health	2,467	200	69	2,736
Labour	769	106	-	875
Municipal Affairs	1,996	603	-	2,599
Occupational Health and Safety	274	91	-	365
Recreation and Parks	174	41	-	215
Solicitor General	1,550	-	-	1,550
Tourism	508	83	-	591
Transportation and Utilities	260	200	-	460
Treasury	1,322	225	79	1,626
TOTAL	**24,704**	**7,324**	**1,581**	**33,609**

TABLE 57. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1989-90

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	-	-	2
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism and Drug Abuse Commission	-	2	-	2	6	3	2	11
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	94	89	51	234
Economic Development and Trade	-	-	-	-	37	2	7	46
Education	2	-	-	2	8	3	4	15
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	6	-	-	6	5	1	-	6
Health	3	1	4	8	28	5	14	47
Labour	-	-	-	-	11	1	8	20
Municipal Affairs	-	-	-	-	31	-	12	43
Occupational Health and Safety	-	-	-	-	5	1	2	8
Recreation and Parks	-	-	-	-	4	2	-	6
Solicitor General	-	-	-	-	12	26	-	38
Tourism	-	-	-	-	9	1	3	13
Transportation and Utilities	-	-	-	-	2	1	5	8
Treasury	-	-	-	-	24	2	8	34
TOTAL	**11**	**3**	**4**	**18**	**315**	**141**	**130**	**586**

TABLE 57. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1989-90 - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	-	-	2
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism and Drug Abuse Commission	-	-	-	-	6	5	2	13
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	94	89	51	234
Economic Development and Trade	-	-	1	1	37	2	8	47
Education	4	1	1	6	14	4	5	23
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	-	-	-	-	11	1	-	12
Health	1	-	-	1	32	6	18	56
Labour	-	-	-	-	11	1	8	20
Municipal Affairs	-	-	-	-	31	-	12	43
Occupational Health and Safety	-	-	-	-	5	1	2	8
Recreation and Parks	-	-	-	-	4	2	-	6
Solicitor General	-	-	-	-	12	26	-	38
Tourism	4	-	1	5	13	1	4	18
Transportation and Utilities	-	-	-	-	2	1	5	8
Treasury	-	-	-	-	24	2	8	34
TOTAL	**9**	**1**	**3**	**13**	**335**	**145**	**137**	**617**

TABLE 58. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1989-90

	Advancement of Science	Environment Issues		Health	Industrial and Economic Development		
		Land	Other		Forestry	Manufacturing	Other
	in thousands of dollars						
Access Network	-	-	-	-	66	-	-
Advanced Education	100	-	-	-	-	-	-
Alcoholism and Drug Abuse Commission	-	-	-	759	-	-	-
Attorney General	-	-	-	-	-	-	-
Career Development and Employment	-	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-	-
Economic Development and Trade	-	-	-	-	-	590	1,530
Education	-	-	-	-	-	-	-
Environment	-	43	-	-	-	-	-
Environment Council	-	-	1,043	-	-	-	-
Family and Social Services	-	-	-	-	-	-	-
Health	-	-	-	4,056	-	-	-
Labour	-	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	-	-
Occupational Health and Safety	-	-	-	477	-	-	-
Recreation and Parks	-	-	-	-	-	-	-
Solicitor General	-	-	-	-	-	-	-
Tourism	-	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-	-
Treasury	-	-	-	-	-	-	-
TOTAL	**100**	**43**	**1,043**	**5,292**	**66**	**590**	**1,530**

TABLE 58. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1989-90 - Concluded

Department or agency	Social development					Transportation	Total
	Culture, sport and recreation	Education	Human resources	Urban and regional studies	Other		
	in thousands of dollars						
Access Network	63	76	-	-	-	-	205
Advanced Education	-	2,475	-	-	72	-	2,647
Alcoholism and Drug Abuse	-	-	-	-	-	-	759
Attorney General	-	-	-	-	300	-	300
Career Development and Employment	-	-	1,654	-	-	-	1,654
Culture and Multiculturalism	19,332	-	-	-	-	-	19,332
Economic Development and Trade	-	-	-	-	-	1,092	3,212
Education	-	2,114	-	-	-	-	2,114
Environment	-	-	-	-	-	-	43
Environment Council	-	-	-	-	-	-	1,043
Family and Social Services	-	130	80	-	604	-	814
Health	-	-	-	-	-	-	4,056
Labour	-	-	875	-	-	-	875
Municipal Affairs	-	-	-	2,663	-	-	2,663
Occupational Health and Safety	-	-	-	-	-	-	477
Recreation and Parks	215	-	-	-	-	-	215
Solicitor General	-	-	-	-	5,040	-	5,040
Tourism	-	-	-	-	1,296	-	1,296
Transportation and Utilities	-	-	-	-	-	460	460
Treasury	-	-	-	-	1,972	-	1,972
TOTAL	**19,610**	**4,795**	**2,609**	**2,653**	**9,284**	**1,552**	**49,177**

TABLE 59. Objectives of Expenditures in the Social Sciences and Humanities by Activity, 1989-90

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	in thousands of dollars				
Advancement of science	-	-	100	-	100
Environmental issues:					
Land	-	-	43	-	43
Other	-	1,043	-	-	1,043
Health	405	3,455	668	764	5,292
Industrial and economic development:					
Forestry	-	66	-	-	66
Manufacturing	-	415	-	175	590
Other	-	1,470	-	60	1,530
Social development:					
Culture, sport and recreation	-	14,444	-	5,166	19,610
Education	255	1,737	112	2,691	4,795
Human resources	-	2,192	-	417	2,609
Urban and regional studies	-	2,599	-	64	2,663
Other	355	3,892	491	4,546	9,284
Transportation	-	1,281	-	271	1,552
TOTAL	1,015	32,594	1,414	14,154	49,177

TABLE 60. Total Expenditures in the Social Sciences and Humanities by Activity and Performer, 1990-91 Estimates

Activity	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Research and development:							
Current expenditures:							
In-house	1,196	...	...	...	...	...	1,196
Contracts	-	150	92	60	5	15	322
Grants	...	-	353	72	-	766	1,191
Research fellowships	-	-	-	-	-	-	-
Administration of extramural R&D programs	68	...	...	...	...	...	68
Sub-total	1,264	150	445	132	5	781	2,777
Capital expenditures	36	...	...	...	...	...	36
Related scientific activities:							
Current expenditures	30,707	4,434	2,053	20	27	5,980	43,221
Administration of extramural RSA programs	512	...	...	...	...	...	512
Sub-total	31,219	4,434	2,053	20	27	5,980	43,733
Capital expenditures	168	...	...	...	...	...	168
TOTAL	**32,687**	**4,584**	**2,498**	**152**	**32**	**6,761**	**46,714**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 61. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Performer, 1990-91 Estimates

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Access Network	160	-	-	-	-	-	160
Advanced Education	497	-	1,989	72	-	100	2,658
Alcoholism and Drug Abuse Commission	592	-	-	-	-	-	592
Attorney General	-	-	303	-	-	-	303
Career Development and Employment	1,195	379	6	-	-	90	1,670
Culture and Multiculturalism	13,660	-	-	-	-	5,224	18,884
Economic Development and Trade	2,449	680	-	-	-	35	3,164
Education	1,134	115	63	-	32	448	1,792
Environment Council	1,243	-	-	-	-	-	1,243
Family and Social Services	847	100	24	-	-	124	1,095
Health	2,797	550	63	60	-	675	4,145
Labour	751	-	-	-	-	-	751
Municipal Affairs	2,277	300	-	-	-	65	2,642
Occupational Health and Safety	381	35	50	20	-	-	486
Recreation and Parks	125	-	-	-	-	-	125
Solicitor General	1,367	1,169	-	-	-	-	2,536
Tourism	853	910	-	-	-	-	1,763
Transportation and Utilities	445	-	-	-	-	-	445
Treasury	1,914	346	-	-	-	-	2,260
TOTAL	**32,687**	**4,584**	**2,498**	**152**	**32**	**6,761**	**46,714**

(1) Includes only annual funding by Government of Alberta - other funds are not included.

TABLE 62. Total Expenditures in the Social Sciences and Humanities by Department or Agency and Activity, 1990-91 Estimates

Department or agency	Research and development			Related scientific activities			Total
	Current	AEP(1)	Capital	Current	AEP(1)	Capital	
	in thousands of dollars						
Access Network	-	-	-	150	-	10	160
Advanced Education	172	4	-	2,478	4	-	2,658
Alcoholism and Drug Abuse Commission	91	-	-	501	-	-	592
Attorney General	303	-	-	-	-	-	303
Career Development and Employment	-	-	-	1,670	-	-	1,670
Culture and Multiculturalism	-	-	-	18,884	-	-	18,884
Economic Development and Trade	-	-	-	3,116	23	25	3,164
Education	240	40	1	1,306	200	5	1,792
Environment Council	-	-	-	1,243	-	-	1,243
Family and Social Services	779	-	25	291	-	-	1,095
Health	1,074	15	10	2,934	50	62	4,145
Labour	-	-	-	751	-	-	751
Municipal Affairs	-	-	-	2,642	-	-	2,642
Occupational Health and Safety	50	9	-	427	-	-	486
Recreation and Parks	-	-	-	125	-	-	125
Solicitor General	-	-	-	2,536	-	-	2,536
Tourism	-	-	-	1,528	235	-	1,763
Transportation and Utilities	-	-	-	420	-	25	445
Treasury	-	-	-	2,219	-	41	2,260
TOTAL	**2,709**	**68**	**36**	**43,221**	**512**	**168**	**46,714**

(1) Administration of extramural programs.

TABLE 63. Total Expenditures on R&D in the Social Sciences and Humanities by Department or Agency and Performer, 1990-91 Estimates

Department or agency	Intramural	Industry	Universities	Hospitals and health organizations	Alberta Research Council(1)	Other	Total
	in thousands of dollars						
Advanced Education	4	-	-	72	-	100	176
Alcoholism and Drug Abuse Commission	91	-	-	-	-	-	91
Attorney General	-	-	303	-	-	-	303
Education	141	50	50	-	5	15	281
Family and Social Services	685	100	19	-	-	-	804
Health	350	-	23	60	-	666	1,099
Occupational Health and Safety	9	-	50	-	-	-	59
TOTAL	**1,300**	**150**	**445**	**132**	**5**	**781**	**2,813**

(1) Includes only annual funding by the Government of Alberta - other funds are not included.

TABLE 64. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1990-91 Estimates

Department or agency	Research and development				Related scientific activities			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
Access Network	-	-	-	-	2	1	-	3
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism and Drug Abuse Commission	-	2	-	2	6	3	2	11
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	94	89	51	234
Economic Development and Trade	-	-	-	-	32	1	6	39
Education	1	-	-	1	7	2	2	11
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	12	-	-	12	4	1	-	5
Health	3	2	3	8	28	5	15	48
Labour	-	-	-	-	7	1	8	16
Municipal Affairs	-	-	-	-	30	-	12	42
Occupational Health and Safety	-	-	-	-	6	1	2	9
Recreation and Parks	-	-	-	-	2	1	-	3
Solicitor General	-	-	-	-	11	21	-	32
Tourism	-	-	-	-	10	1	3	14
Transportation and Utilities	-	-	-	-	2	1	5	8
Treasury	-	-	-	-	24	2	7	33
TOTAL	16	4	3	23	302	134	127	563

TABLE 64. Departmental Personnel Engaged in Scientific Activities in the Social Sciences and Humanities by Department or Agency, 1990-91 Estimates - Concluded

Department or agency	Administration of extramural programs				Total			
	Scientific and professional	Technical	Other	Total	Scientific and professional	Technical	Other	Total
	(person-years)							
ACCESS Network	-	-	-	-	2	1	-	3
Advanced Education	-	-	-	-	8	-	3	11
Alcoholism and Drug Abuse Commission	-	-	-	-	6	5	2	13
Career Development and Employment	-	-	-	-	19	1	4	24
Culture and Multiculturalism	-	-	-	-	94	89	51	234
Economic Development and Trade	-	-	1	1	32	1	7	40
Education	3	1	1	5	11	3	3	17
Environment Council	-	-	-	-	10	3	7	20
Family and Social Services	-	-	-	-	16	1	-	17
Health	1	-	-	1	32	7	18	57
Labour	-	-	-	-	7	1	8	16
Municipal Affairs	-	-	-	-	30	-	12	42
Occupational Health and Safety	-	-	-	-	6	1	2	9
Recreation and Parks	-	-	-	-	2	1	-	3
Solicitor General	-	-	-	-	11	21	-	32
Tourism	5	-	1	6	15	1	4	20
Transportation and Utilities	-	-	-	-	2	1	5	8
Treasury	-	-	-	-	24	2	7	33
TOTAL	9	1	3	13	327	139	133	599

TABLE 65. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1990-91 Estimates

	Advancement of Science	Environment Issues	Health	Industrial and Economic Development		
		Other		Forestry	Manufacturing	Other
	in thousands of dollars					
Access Network	-	-	-	25	-	-
Advanced Education	100	-	-	-	-	-
Alcoholism and Drug Abuse Commission	-	-	592	-	-	-
Attorney General	-	-	-	-	-	-
Career Development and Employment	-	-	-	-	-	-
Culture and Multiculturalism	-	-	-	-	-	-
Economic Development and Trade	-	-	-	-	749	1,895
Education	-	-	-	-	-	-
Environment Council	-	1,243	-	-	-	-
Family and Social Services	-	-	-	-	-	-
Health	-	-	4,145	-	-	-
Labour	-	-	-	-	-	-
Municipal Affairs	-	-	-	-	-	-
Occupational Health and Safety	-	-	486	-	-	-
Recreation and Parks	-	-	-	-	-	-
Solicitor General	-	-	-	-	-	-
Tourism	-	-	-	-	-	-
Transportation and Utilities	-	-	-	-	-	-
Treasury	-	-	-	-	-	-
TOTAL	**100**	**1,243**	**5,223**	**25**	**749**	**1,895**

TABLE 65. Objectives of Expenditures in the Social Sciences and Humanities by Department or Agency, 1990-91 Estimates - Concluded

Department or agency	Social development					Transportation	Total
	Culture, sport and recreation	Education	Human resources	Urban and studies	Other		
	in thousands of dollars						
Access Network	-	135	-	-	-	-	160
Advanced Education	800	1,686	-	-	72	-	2,658
Alcoholism and Drug Abuse Commission	-	-	-	-	-	-	592
Attorney General	-	-	-	-	303	-	303
Career Development and Employment	-	-	1,670	-	-	-	1,670
Culture and Multiculturalism	18,884	-	-	-	-	-	18,884
Economic Development and Trade	-	-	-	-	-	520	3,164
Education	-	1,792	-	-	-	-	1,792
Environment Council	-	-	-	-	-	-	1,243
Family and Social Services	-	130	80	-	885	-	1,095
Health	-	-	-	-	-	-	4,145
Labour	-	-	751	-	-	-	751
Municipal Affairs	-	-	-	2,642	-	-	2,642
Occupational Health and Safety	-	-	-	-	-	-	486
Recreation and Parks	125	-	-	-	-	-	125
Solicitor General	-	-	-	-	2,536	-	2,536
Tourism	-	-	-	-	1,763	-	1,763
Transportation and Utilities	-	-	-	-	-	445	445
Treasury	-	-	-	-	2,260	-	2,260
TOTAL	**19,809**	**3,743**	**2,501**	**2,642**	**7,819**	**965**	**46,714**

TABLE 66. Objectives of Expenditures in the Social Sciences and Humanities by Activity, 1990-91 Estimates

Objective	Intramural		Extramural		Total
	Research and development	Related scientific activities	Research and development	Related scientific activities	
	in thousands of dollars				
Advancement of science	-	-	100	-	100
Environmental issues:					
Other	-	1,243	-	-	1,243
Health	450	3,320	799	654	5,223
Industrial and economic development:					
Forestry	-	25	-	-	25
Manufacturing	-	454	-	295	749
Other	-	1,695	-	200	1,895
Social development:					
Culture, sport and recreation	-	13,785	-	6,024	19,809
Education	165	1,613	120	1,845	3,743
Human resources	-	2,026	-	475	2,501
Urban and regional studies	-	2,277	-	365	2,642
Other	685	4,204	494	2,436	7,819
Transportation	-	745	-	220	965
TOTAL	1,300	31,387	1,513	12,514	46,714

Appendix

RESPONDENTS

1989-90

The following Departments are currently involved in scientific activities in the province of Alberta. The coordinator listed is the person responsible for reporting the expenditures. We wish to thank the coordinators, as well as those who assisted in the amalgamation of data, for their time and efforts in providing these statistics.

Access Network — Coordinator: Junichi Kawashima, 541-7272

Access Network is involved with the development and application of interactive videodiscs for training. Operational projects include: Forest Fire Control - training (the initial assessment and attack of wildfires); The Survey Disc - system to train survey technology students how to use a rod and level; ASL in Canada - videodisc dictionary of over 4000 American Sign Language signs.

Advanced Education — Coordinator: Colleen Mead, 422-4845

Research and Information Support is responsible for collection and analysis of data for the development of long term plans and policy alternatives in the area of post-secondary education. Research and analysis are undertaken both to identify the most probable demographic, social and economic trends in Alberta and to determine the implications of those trends for providing post-secondary education to Albertans. Special purpose grants are awarded primarily to private non-profit foundations or research institutes to examine various aspects of public policies as they relate to western Canada.

Agriculture — Coordinator: Dr. R.G. Christian, 422-1072

The Department operates a number of research units in Alberta as well as supporting agriculture related research projects. Research and development grants provide extramural support for activities in crop production, livestock production, agricultural processing and agricultural marketing.

The Alberta Agricultural Research Institute, a crown corporation, coordinates, supports and promotes agricultural research, and is included with Alberta Agriculture.

Alcoholism and Drug Abuse Commission — Coordinator: Dr. David Hewitt, 427-4275

The Commission carries out surveys and special studies required for program evaluation, policy analysis and needs assessment. This year the commission received a federal grant (NHRDP), for investigating client efficacy and alcohol effect expectancies as predictors of alcohol treatment outcome.

Attorney General — Coordinator: D. Chow, 427-4997

The Department makes an annual research grant to the Institute of Law Research and Reform at the University of Alberta.

RESPONDENTS (Continued)

Career Development and Employment — Coordinator: Joe Hammond 427-8506

The Labour Market Research Division is responsible for the provision of a wide range of planning, research, policy analysis and evaluation services which assist the Department in the development and implementation of its policies, programs and services throughout the province.

Culture and Multiculturalism — Coordinator: Ken MacLean 427-2921

This year's response indicated considerable change from the previous two years. The reporting system was reassessed and the department will now report some previously missed R&A expenditures. Historical changes have been included in this report.

Economic Development and Trade — Coordinator: Terry E. Eliuk 427-0675

The activities of Economic Development and Trade were centered on special services and studies, and, to a lesser extent statistitcal surveys. Many of the activities were economic in nature and used for government planning, policy formulation, publication, and distribution to private sector.

Education — Coordinator: Pat Ehman 427-2991

The Planning and Policy Secretariat is involved chiefly with issue-oriented research of a cross-sectional nature as well as studies and surveys.

Energy — Coordinator: J.K. Kleta 427-8042

The Research and Technology Branch supports a large volume of S&T activity. Projects relate to furthering the development and use of the province's energy resources with emphasis on coal, renewable energy, conservation and hydrogen.

Alberta Environmental Centre — Coordinator: S. Steinbach 149-1246

The Centre is an inter-disciplinary research and service agency which studies and solves environmental problems identified by departments and agencies of the Government of Alberta.

Environment — Coordinator: Sharron Steinbach 632-6761

Most of the activity is in the Natural Sciences with eight programs reporting: Development and Operations Division, Hydrogeology Branch, Reclamation Research Technical Advisory Committee, Survey Branch, Standards and Approvals Division, and Water Resources Management Services - Technical Services Division. Planning Division did not resubmit a natural science questionnaire this year and the social science questionnaire shows considerably less than reported last year, as funding did not materialize.

Environment Council of Alberta — Coordinator: Al Giacomazzi 427-5792

The Council offers support for reviewing Environmental programs in the province, compiling background information for a Conservation Strategy for Alberta, and providing support services to the Public Advisory Committees.

RESPONDENTS (Continued)

Family and Social Services — Coordinator: Barb Pederson 441-6752

The Management Reporting Services carried out a number of intramural and extramural activities including the Development of Quality Assurance Program, the Development of Case Management Model, and the Development of Child Welfare Information System.

Forestry, Lands and Wildlife — Coordinator: G. Brian Maier 422-1038

Scientific expenditures are reported for Alberta Forest Service, Fish and Wildlife, Public Lands, Land Information Services, and Forest Industry Development. Intramural expenditures include activities such as field investigations and inventories, surveys and analysis, special studies and reports, and information systems development.

Health — Coordinator: Dr. Y.M. Cheung 427-1420

The Health and Economics Statistics reports scientific activities for the Public Health Division, Information Technology Division, Hospital Services Division, Policy and Planning Services Division, Public Health Division, Mental Health Division, and the Provincial Medical Consultant's Office. The Public Health Division reports the department's social science activities as well as natural science activities. In the social sciences, a grant of $2.8 million was awarded to the Alberta Cancer Board from the Alberta Heritage Savings Fund for Applied Cancer Research. Most of this work was carried out by the Universities of Alberta and Calgary, the Cross Cancer Institute, and the Tom Baker Centre.

Alberta Heritage Foundation for Medical Research — Coordinator: A.J. Nykolyn 423-5727

The Foundation supported mainly by an endowment fund, supports medical research based in Alberta. This year's response contains a new element, the Medical Innovation Program. The Foundation administers the program, although the funding comes from Technology, Research and Telecommunications (actually Bill C-22 money).

Labour — Coordinator: Janet E. Howell 427-8531

The development of national and provincial safety standards and software development are part of Labour's natural science activities. Social science activities include collection, dissemination, development and analysis of labour information.

Municipal Affairs — Coordinator: Linda Holmen or Terry Toth 427-8150

Municipal Affairs carried on a number of intramural and extramural activities. The Innovative Housing Grant Program, which provides grants to industry, institutions and individuals to carry out research pertaining to housing, continued. The Housing Planning Secretariat carried out policy and program development, program evaluation, and housing market analysis and forecasting. The Planning, Research and Development Branch continued on-going support to various projects, including Land Use information publications, Vision 2020 and a Pilot project directed at community based tourism action plans.

RESPONDENTS (Continued)

Occupational Health and Safety — Coordinator: Jill Mercer 427-8943

The Occupational Health and Safety Heritage Grant Program supports applied research projects which have as their goal the reduction of injuries and illnesses resulting from employment. The Health Advisory Services and the Policy and Professional Services Division report development, analysis and studies into health related topics and occupational health and safety issues.

Alberta Oil Sands Technology and Research Authority — Coordinator: Walter Kowaluk 427-7623

Alberta Heritage Trust is the primary source of funds for AOSTRA which awards numerous contracts for research and development. The industrial sector receives the majority of the money followed by universities and the Alberta Research Council.

Recreation and Parks — Coordinator: Mike Boyd 422-1730

The major objective reported by this Department for both the natural and social sciences is development in the area of culture, sport and recreation. The department's involvement in research-related activities decreased significantly in 1989-90 as a result of the conclusion of work on 5 departmental strategies in 1988-89 and a major reorganization within the department during 1989. Projected department figures for 1990-91 reflect lower estimates of expenditures as a result of the new organization.

Solicitor General — Coordinator: K. Murphy 427-0734

Related scientific activities include research, special studies, statistical reporting, EDP systems development and product testing.

The Solicitor General's department was involved intramurally and extramurally in a number of related scientific activities. Activities included a blood inquiry, native task force and EDP systems development.

Special Waste Management Corporation — Coordinator: Tom Thackeray 422-5029

The Special Waste Management Corporation funds extramural activities in the areas of technical surveys and information services.

Technology, Research and Telecommunications — Coordinator: Keith Walton 422-0567

Technology, Research and Telecommunications is involved with such major projects as the development of provincial science and telecommunication policy. The department also supplies financial assistance in support of research to the university and industrial sectors, and is the main source of provincial funding for the Alberta Research Council.

Tourism — Coordinator: Darell Pavemovich 427-4837

Related scientific activities are carried out by three units - Library, Strategic Planning, and Destination Planning. Major projects include an economic impact and forecasting model, development, and analysis on tourism.

RESPONDENTS (Concluded)

Transportation and Utilities — Coordinator: Alan Mah, 422-2750

Most of the activity is in natural sciences with eight programs reporting. These include Design Engineering Branch, Research and Development Branch, Urban Transportation Branch, Contracts Engineering Branch, Bridge Engineering Branch, Roadway Planning Branch, Traffic Engineering Branch and the Materials Engineering Branch. The social science expenditures are reported by the Planning and Statistics Branch. Activities include analysis, and technical and economic studies on aspects relating to transportation.

Treasury — Coordinator: Bill Hyshka, 427-3058

The Alberta Bureau of Statistics collects, compiles, analyses, abstracts and publishes statistical information on the commercial, industrial, financial, social , economic and general activities and conditions of the province.

INDICATORS OF PROVINCIAL SCIENTIFIC ACTIVITIES

1. Economic Indicators

Province	Population January/90(1)		Provincial Gross Domestic Product per capita 1988(1)		Gross Domestic Expenditures on Research and Development, 1988(2)		Provincial GERD/PGDP 1988-89	
	in thousands	rank	dollars	rank	in millions of $	rank	per cent	rank
Newfoundland	573	9	13,724	9	81	9	1.0	6
Prince Edward Island .	131	10	13,450	10	13	10	0.7	9
Nova Scotia	889	7	16,664	7	206	5	1.4	2
New Brunswick	722	8	16,241	8	143	8	1.2	4
Québec	6,736	2	21,382	4	1,859	2	1.3	3
Ontario	9,668	1	25,648	2	4,274	1	1.7	1
Manitoba	1,087	5	19,764	5	205	6	1.0	5
Saskatchewan	1,002	6	18,541	6	146	7	0.8	8
Alberta	**2,449**	**4**	**25,924**	**1**	**610**	**3**	**0.9**	**7**
British Columbia	3,106	3	21,963	3	509	4	0.7	10
Canada(3)	**26,440**		**22,790**		**8,058**		**1.4**	

(1) **Canadian Economic Observer**, Statistics Canada, Catalogue No. 11-010, July 1990.
(2) **Science Statistics**, Catalogue No. 88-001, Vol. 14, No. 7, September 1990.
(3) Includes the Yukon and Northwest Territories.

2. Higher Education

Province	Total research and development expenditures in the higher education sector, 1988-89(1)			Sponsored research in universities, 1988-89(2)		
	in millions of $	$ per capita	rank	in millions of $	$ per capita	rank
Newfoundland	39	68	5	18	31	8
Prince Edward Island	3	23	10	1	8	10
Nova Scotia	64	72	4	40	45	4
New Brunswick	29	40	9	18	25	9
Québec	437	65	6	337	50	2
Ontario	781	81	2	469	49	3
Manitoba	85	78	3	43	40	5
Saskatchewan	57	57	7	39	39	6
Alberta	**231**	**94**	**1**	**127**	**52**	**1**
British Columbia	155	50	8	98	32	7
Canada	**1,881**	**71**		**1,191**	**45**	

(1) "Estimation of Research and Development Expenditures in the Higher Education Sector, 1988-89", Services, Science and Technology Division, Statistics Canada, August, 1990, ST-90-05.
(2) **Financial Statistics of Universities and Colleges, 1988-89**, Canadian Association of University Business Officers.

3. Industry

Province	Value added by manufacturing industries per capita, 1987(1)		Current intramural industrial R&D expenditures per employee in primary and secondary industry, 1988(2)	
	dollars	rank	dollars	rank
Newfoundland	1,372	8	41	10
Prince Edward Island	1,051	10	200	7
Nova Scotia	2,225	7	611	3
New Brunswick	2,898	4	233	6
Québec	4,496	2	1,069	2
Ontario	6,460	1	1,532	1
Manitoba	2,677	5	165	8
Saskatchewan	1,368	9	141	9
Alberta	2,262	6	491	4
British Columbia	3,448	3	376	5
Canada(3)	4,474		1,010	

(1) **Manufacturing Industries of Canada; National and Provincial Areas, 1987**, Statistics Canada, Catalogue No. 31-203.
(2) Results of 1988 Industrial R&D survey, Services, Science and Technology Division, Statistics Canada and **Labour Force Information, July, 1990**, Statistics Canada, Catalogue No. 71-001P.
(3) Includes the Yukon and Northwest Territories.

4. Federal Government

Province	Total intramural expenditures on scientific activities 1988-89(1)	Total Federal scientific personnel 1988-89(2)	Total extramural payments on scientific activities 1988-89(1)
	in millions of $	person-years	in millions of $
Newfoundland	53	568	22
Prince Edward Island	9	129	6
Nova Scotia	132	1,616	64
New Brunswick	41	606	39
Québec	312	3,985	501
Ontario	1,574	20,887	676
Manitoba	104	1,640	48
Saskatchewan	51	738	37
Alberta	109	1,447	93
British Columbia	134	1,724	167
Canada(3)	2,547	33,540	1,658

(1) **Science Statistics**, Catalogue No. 88-001, Vol. 14, No. 8, November 1990.
(2) "Regional Distribution of Federal Expenditures on Science and Technology 1988-89", Services, Science and Technology Division, Statistics Canada, October 1990, ST-90-07.
(3) Includes the Yukon and Northwest Territories.

5. Provincial Government

Province	Total provincial expenditures on scientific activities, 1988-89(1)			Total scientific expenditures of Provincial Research Organizations, 1989(2)	
	in millions of $	$ per capita	rank	in millions of $	rank
Newfoundland	32.7	57	3	...	...
Nova Scotia	47.5	53	4	7.1	7
New Brunswick	26.4	37	8	8.4	6
Québec	449.5(p)	67	2	32.4	2
Ontario	411.7	43	6	31.2	3
Manitoba	34.6	32	9	5.9	8
Saskatchewan	44.3	44	5	18.0	4
Alberta	**234.4**	**96**	**1**	**50.7**	**1**
British Columbia	128.2	41	7	10.9	5
Total	**1,409.3(3)**	**470**		**164.6**	

(1) "Scientific and Technological Activities of Provincial Governments, 1981-82 to 1989-90", Services, Science and Technology Division, Statistics Canada, August 1990, ST-90-02.
(2) Science Statistics, Catalogue No. 88-001, Vol. 14, No. 9, December 1990.
(3) Does not include scientific activities of the provincial governments of Prince Edward Island nor the Yukon and Northwest Territories.

6. Gross Domestic Expenditures on R&D in Canada, by Performing Sector, by Province, 1988(1)

Province	Federal government	Provincial government	Provincial research organization	Total government	Industry	University	Private non-profit	All sectors
	in millions of $							
Newfoundland	29	4	-	33	9	39	-	81
Prince Edward Island	8	-	-	8	2	3	-	13
Nova Scotia	74	4	3	81	60	64	1	206
New Brunswick	26	2	3	31	82	29	1	143
Québec	154	49	18	221	1,158	437	43	1,859
Ontario	770	58	13	841	2,591	781	61	4,274
Manitoba	77	1	2	80	35	85	5	205
Saskatchewan	40	4	6	50	39	57	-	146
Alberta	**65**	**29**	**31**	**125**	**254**	**231**	**1**	**610**
British Columbia	78	14	4	96	251	155	7	509
Canada(2)	**1,322**	**165**	**80**	**1,567**	**4,492**	**1,881**	**118**	**8,058**

(1) "Estimates of Canadian Research and Development Expenditures (GERD), National 1963 to 1990, and by Province 1979 to 1988", Services, Science and Technology Division, Statistics Canada, August 1990, ST-90-06.
(2) Includes the Yukon and Northwest Territories.

7. Gross Domestic Expenditures on R&D in Canada, by Funding Sector, by Province, 1988(1)

Province	Federal government	Provincial government	Alberta Research organization	Total government	Industry	University	Private non-profit	All sectors (3)
	in millions of $							
Newfoundland	47	5	-	52	6	21	1	81
Prince Edward Island .	9	-	-	9	2	2	-	13
Nova Scotia	121	9	-	130	42	24	5	206
New Brunswick	59	6	-	65	62	12	-	143
Québec	484	182	1	667	941	96	35	1,859
Ontario	1,225	163	-	1,388	1,806	320	81	4,274
Manitoba	106	7	-	113	32	42	11	205
Saskatchewan	67	21	-	88	35	18	2	146
Alberta	**128**	**118**	**2**	**248**	**231**	**104**	**8**	**610**
British Columbia	188	32	-	220	201	57	15	509
Canada(2)	**2,436**	**544**	**3**	**2,983**	**3,369**	**694**	**159**	**8,058**

(1) "Estimates of Canadian Research and Development Expenditures (GERD), National 1963 to 1990, and by Province 1979 to 1988", Services, Science and Technology Division, Statistics Canada, August 1990, ST-90-06.
(2) Includes the Yukon and Northwest Territories.
(3) Includes Foreign sources of funds.

8. Gross Domestic Expenditures on R&D in Alberta, 1988(1)

Funding sector	Performing sector							
	Governments				Business enterprise	Higher education	Private non-profit	Total
	Federal	Provincial	Alta Research Council	Total				
	in millions of $							
Governments								
Federal	65	-	1	66	11	51	-	128
Provincial	-	29	23	52	17	49	1	118
Alta Research Council ..	-	-	2	2	-	-	-	2
Sub-total	65	29	26	120	28	100	1	248
Business enterprise	-	-	4	4	209	18	-	231
Higher education	-	-	-	-	-	104	-	104
Private non-profit	-	-	-	-	-	8	-	8
Foreign	-	-	1	1	17	1	-	19
Total	**65**	**29**	**31**	**125**	**254**	**231**	**1**	**610**

(1) "Estimates of Canadian Research and Development Expenditures (GERD), National 1963 to 1990, and by Province 1979 to 1988", Services, Science and Technology Division, Statistics Canada, August 1990, ST-90-06.

9. Federal Government Grants and Contracts to Industry for R&D in the Natural Sciences, by Selected Department/Program and Region, 1988-89(1)

Department/Program	NFLD	PEI	NS	NB	QUE	ONT	MAN	SASK	ALTA	BC	CANADA(2)
	in millions of $										
A. R&D Grants:											
Industry, Science and Technology:											
Industrial and Regional Development Program	—	-	-	18.8	9.0	14.3	-	-	-	-	42.1
Defence Industry Productivity Program	-	-	3.4	-	99.1	39.0	-	-	-	5.1	146.6
Other	—	-	0.2	—	5.9	4.6	0.5	0.3	0.2	0.5	12.4
Sub-total	—	-	3.6	18.8	114.0	57.9	0.5	0.3	0.2	5.6	201.1
National Research Council:											
Industrial Research Assistance Program	1.4	1.4	1.9	1.4	14.3	26.1	2.4	1.8	4.5	6.6	62.1
Other	0.5	0.1	0.3	0.2	6.6	4.6	0.1	0.3	0.8	0.8	14.3
Sub-total	1.9	1.5	2.2	1.6	20.9	30.7	2.5	2.1	5.3	7.4	76.4
Other	0.1	-	0.2	-	13.5	11.4	0.5	3.0	2.9	3.6	34.8
Total	**2.0**	**1.5**	**6.0**	**20.4**	**148.4**	**100.0**	**3.5**	**5.4**	**8.4**	**16.6**	**312.3**
B. R&D Contracts:											
National Defence	0.4	-	4.1	—	9.5	77.8	4.5	—	2.4	4.5	103.3
National Research Council	0.7	-	0.2	-	1.3	43.8	0.2	1.5	-	0.2	47.9
Supply and Services	0.5	-	1.9	—	1.6	5.4	0.2	0.1	0.6	3.7	14.1
Other	0.8	0.1	2.4	0.6	15.8	28.1	1.4	0.9	3.8	8.0	61.7
Total	**2.4**	**0.1**	**8.6**	**0.6**	**28.2**	**155.1**	**6.3**	**2.5**	**6.8**	**16.4**	**227.0**
Total, grants and contracts	**4.4**	**1.6**	**14.6**	**21.0**	**176.6**	**255.1**	**9.8**	**7.9**	**15.2**	**33.0**	**539.3**

(1) Science Statistics, Catalogue No. 88-001, Vol. 14, No. 8, November 1990.
(2) Includes Yukon and Northwest Territories.
The data expressed here are regional representations and will not correspond to Canada aggregates shown in other Statistics Canada publications. Total may not add due to rounding.

10. Federal Government Expenditures on Scientific Activities in the Natural Sciences, by Region and Selected Departments, 1988-89(1)

Region	Agriculture	Energy, Mines and Resources	Environment	Industry Science and Technology	National Defence	National Research Council	Natural Sciences and Engineering Research Council	Other	Total
	in millions of $								
Newfoundland	2	3	5	-	—	15	7	32	64
Prince Edward Island .	8	2	1	-	—	2	—	1	14
Nova Scotia	10	17	16	5	22	12	12	70	164
New Brunswick	9	2	7	19	-	2	7	25	71
Québec	31	29	63	117	56	60	80	208	644
Ontario	126	208	144	81	147	305	157	437	1,605
Manitoba	36	2	18	1	5	6	10	56	134
Saskatchewan	25	4	13	1	-	16	12	9	80
Alberta	28	25	31	1	23	7	29	39	183
British Columbia	18	14	31	7	19	43	44	96	272
Canada(2)	293	318	342	232	272	468	358	977	3,260

(1) "Regional Distribution of Federal Expenditures on Science and Technology, 1988-89", Services, Science and Technology Division, Statistics Canada, November 1990, ST-90-07.
(2) Includes Yukon and Northwest Territories.

11. Federal Government Intramural Expenditures on Scientific Activities in the Natural Sciences by Region and Selected Departments, 1988-89(1)

Region	Agriculture	Atomic Energy of Canada Ltd	Energy, Mines and Resources	Environment	Fisheries and Oceans	National Defence	National Research Council	Other	Total
	in millions of $								
Newfoundland	2	-	-	5	25	-	12	3	47
Prince Edward Island .	7	-	-	1	—	-	—	-	8
Nova Scotia	9	-	13	15	51	18	8	1	115
New Brunswick	9	-	-	7	16	-	—	7	39
Québec	27	-	5	48	19	45	36	40	220
Ontario	121	71	184	135	25	62	227	219	1,044
Manitoba	33	30	-	18	11	-	3	1	96
Saskatchewan	21	-	3	12	-	-	12	-	48
Alberta	28	-	20	30	-	20	—	6	104
British Columbia	17	-	7	28	42	14	8	10	126
Canada(2)	274	101	244	311	188	158	307	289	1,872

(1) "Regional Distribution of Federal Expenditures on Science and Technology, 1988-89", Services, Science and Technology Division, Statistics Canada, November 1990, ST-90-07.
(2) Includes Yukon and Northwest Territories.

12. Federal Government Intramural Expenditures on R&D in the Natural Sciences, by Region and Selected Departments, 1988-89(1)

Region	Agriculture	Atomic Energy of Canada Ltd	Energy, Mines and Resources	Environment	Fisheries and Oceans	National Defence	National Research Council	Other	Total
	in millions of $								
Newfoundland	2	-	-	—	10	-	11	4	27
Prince Edward Island .	7	-	-	—	—	-	-	-	7
Nova Scotia	9	-	1	1	33	18	7	-	68
New Brunswick	9	-	-	2	6	-	-	7	24
Québec	27	-	4	5	11	45	30	16	138
Ontario	100	66	72	33	9	61	194	118	653
Manitoba	30	28	-	1	9	-	2	1	71
Saskatchewan	20	-	2	6	-	-	9	-	37
Alberta	26	-	5	2	-	20	—	7	60
British Columbia	17	-	1	1	28	14	6	5	72
Canada(2)	247	94	85	52	107	156	259	157	1,157

(1) "Regional Distribution of Federal Expenditures on Science and Technology, 1988-89", Services, Science and Technology Division, Statistics Canada, November 1990, ST-90-07.
(2) Includes Yukon and Northwest Territories.

13. Federal Government Personnel Engaged in Scientific Activities in the Natural Sciences, by Region and Selected Departments, 1988-89(1)

Region	Agriculture	Atomic Energy of Canada Ltd	Energy, Mines and Resources	Environment	Fisheries and Oceans	National Defence	National Research Council	Other	Total
	person-years								
Newfoundland	32	-	-	72	248	-	61	68	481
Prince Edward Island .	105	-	-	12	6	-	1	-	124
Nova Scotia	138	-	136	193	571	203	84	16	1,341
New Brunswick	144	-	-	96	187	-	3	144	574
Québec	414	-	6	562	173	612	339	621	2,727
Ontario	1,671	1,709	2,242	1,353	307	723	2,539	2,965	13,509
Manitoba	359	733	-	278	136	-	25	18	1,549
Saskatchewan	361	-	5	175	-	-	136	5	682
Alberta	462	-	204	413	-	189	4	102	1,374
British Columbia	261	-	77	358	468	137	102	194	1,597
Canada(2)	3,948	2,442	2,682	3,635	2,095	1,864	3,294	4,147	24,107

(1) "Regional Distribution of Federal Expenditures on Science and Technology, 1988-89", Services, Science and Technology Division, Statistics Canada, November 1990, ST-90-07.
(2) Includes Yukon and Northwest Territories.

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